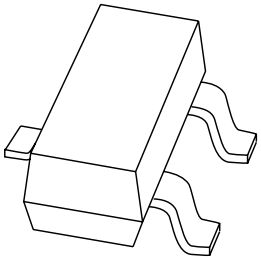
DATA SHEET



PBSS5240T

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

Product specification
Supersedes data of 2001 Oct 31

2004 Jan 15

Philips
Semiconductors

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

PBSS5240T

FEATURES

- Low collector-emitter saturation voltage
- High current capability
- Improved device reliability due to reduced heat generation
- Replacement for SOT89/SOT223 standard packaged transistor.

APPLICATIONS

- Supply line switching circuits
- Battery management applications
- DC/DC converter applications
- Strobe flash units
- Heavy duty battery powered equipment (motor and lamp drivers).

DESCRIPTION

PNP low V_{CEsat} transistor in a SOT23 plastic package.
NPN complement: PBSS4240T.

MARKING

TYPE NUMBER	MARKING CODE(1)
PBSS5240T	ZF*

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	–40	V
I_C	collector current (DC)	–2	A
I_{CM}	peak collector current	–3	A
R_{CEsat}	equivalent on-resistance	<220	mΩ

PINNING

PIN	DESCRIPTION
1	base
2	emitter
3	collector

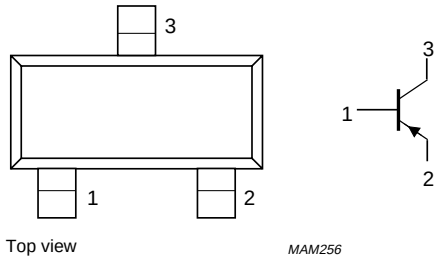


Fig.1 Simplified outline (SOT23) and symbol.

ORDERING INFORMATION

TYPE NUMBER	PACKAGE		
	NAME	DESCRIPTION	VERSION
PBSS5240T	–	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	–	–40	V
V_{CEO}	collector-emitter voltage	open base	–	–40	V
V_{EBO}	emitter-base voltage	open collector	–	–5	V
I_C	collector current (DC)		–	–2	A
I_{CM}	peak collector current		–	–3	A
I_{BM}	peak base current		–	–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_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C
T_{amb}	operating ambient temperature		–65	+150	°C

Notes

1. Device mounted on a printed-circuit board, single sided copper, tin plated, standard footprint.
2. Device mounted on a printed-circuit board, single sided copper, tin plated, mounting pad for collector 1 cm^2.

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 printed-circuit board, single sided copper, tin plated, standard footprint.
2. Device mounted on a printed-circuit board, single sided copper, tin plated, mounting pad for collector 1 cm^2.

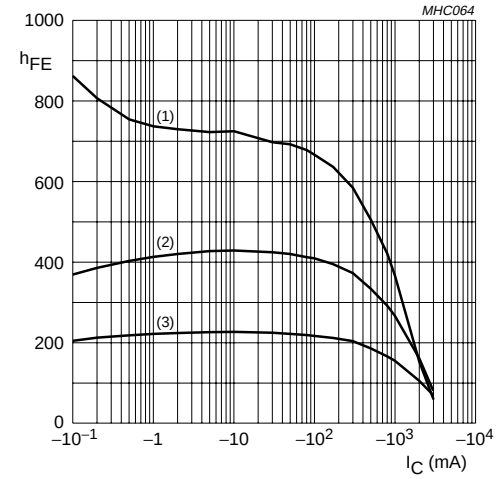
CHARACTERISTICS

T_{amb} = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_{CBO}	collector-base cut-off current	V_{CB} = –30 V; I_E = 0	–	–	–100	nA
		V_{CB} = –30 V; I_E = 0; T_j = 150 °C	–	–	–50	μA
I_{BEO}	emitter-base cut-off current	V_{EB} = –4 V; I_C = 0	–	–	–100	nA
h_{FE}	DC current gain	V_{CE} = –2 V				
		I_C = –100 mA	300	450	–	
		I_C = –500 mA	260	350	–	
		I_C = –1 A	210	290	–	
		I_C = –2 A	100	180	–	
V_{CEsat}	collector-emitter saturation voltage	I_C = –100 mA; I_B = –1 mA	–	–55	–100	mV
		I_C = –500 mA; I_B = –50 mA	–	–70	–110	mV
		I_C = –750 mA; I_B = –15 mA	–	–140	–225	mV
		I_C = –1 A; I_B = –50 mA	–	–140	–225	mV
		I_C = –2 A; I_B = –200 mA	–	–240	–350	mV
R_{CEsat}	equivalent on-resistance	I_C = –500 mA; I_B = –50 mA; note 1	–	160	<220	mΩ
V_{BEsat}	base-emitter saturation voltage	I_C = –2 A; I_B = –200 mA	–	–	–1.1	V
$V_{BE(on)}$	base-emitter turn-on voltage	V_{CE} = –2 V; I_C = –100 mA	–	–	–0.75	V
f_T	transition frequency	I_C = –100 mA; V_{CE} = –10 V; f = 100 MHz	100	200	–	MHz
C_c	collector capacitance	V_{CB} = –10 V; I_E = I_e = 0; f = 1 MHz	–	23	28	pF

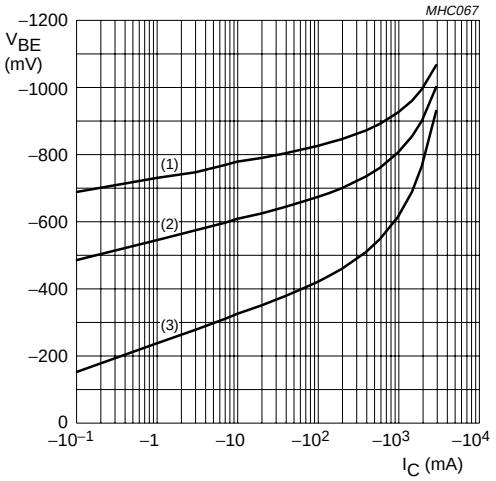
Note

1. Device mounted on a printed-circuit board, single sided copper, tin plated, standard footprint.



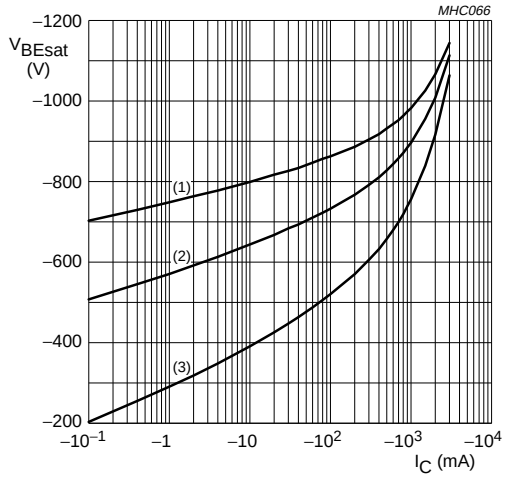
V_{CE} = −2V.
(1) T_{amb} = 150 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = −55 °C.

Fig.2 DC current gain as a function of collector current; typical values.



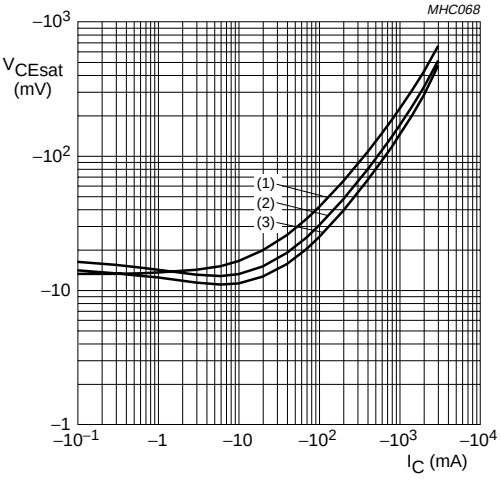
V_{CE} = −2V.
(1) T_{amb} = −55 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = 150 °C.

Fig.3 Base-emitter voltage as a function of collector current; typical values.



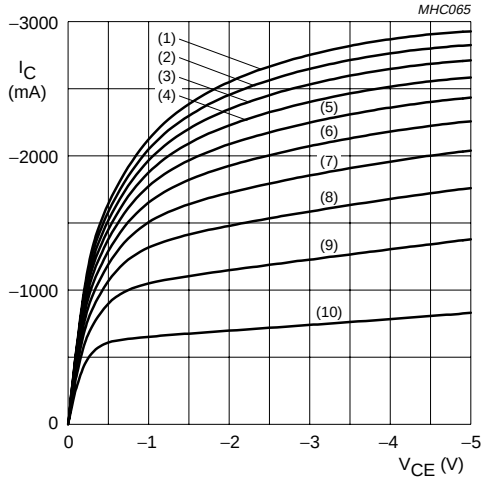
I_C/I_B = 20.
(1) T_{amb} = −55 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = 150 °C.

Fig.4 Base-emitter saturation voltage as a function of collector current; typical values.



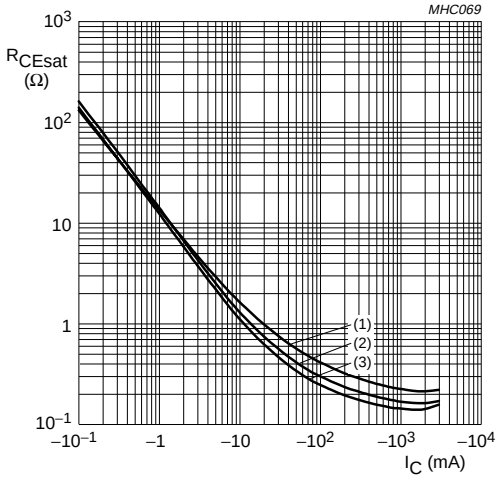
I_C/I_B = 20.
(1) T_{amb} = 150 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = −55 °C.

Fig.5 Collector-emitter saturation voltage as a function of collector current; typical values.



(1) I_B = −23.0 mA.
(2) I_B = −20.7 mA.
(3) I_B = −18.4 mA.
(4) I_B = −16.1 mA.
(5) I_B = −13.8 mA.
(6) I_B = −11.5 mA.
(7) I_B = −9.2 mA.
(8) I_B = −6.9 mA.
(9) I_B = −4.6 mA.
(10) I_B = −2.3 mA.

Fig.6 Collector current as a function of collector-emitter voltage; typical values.

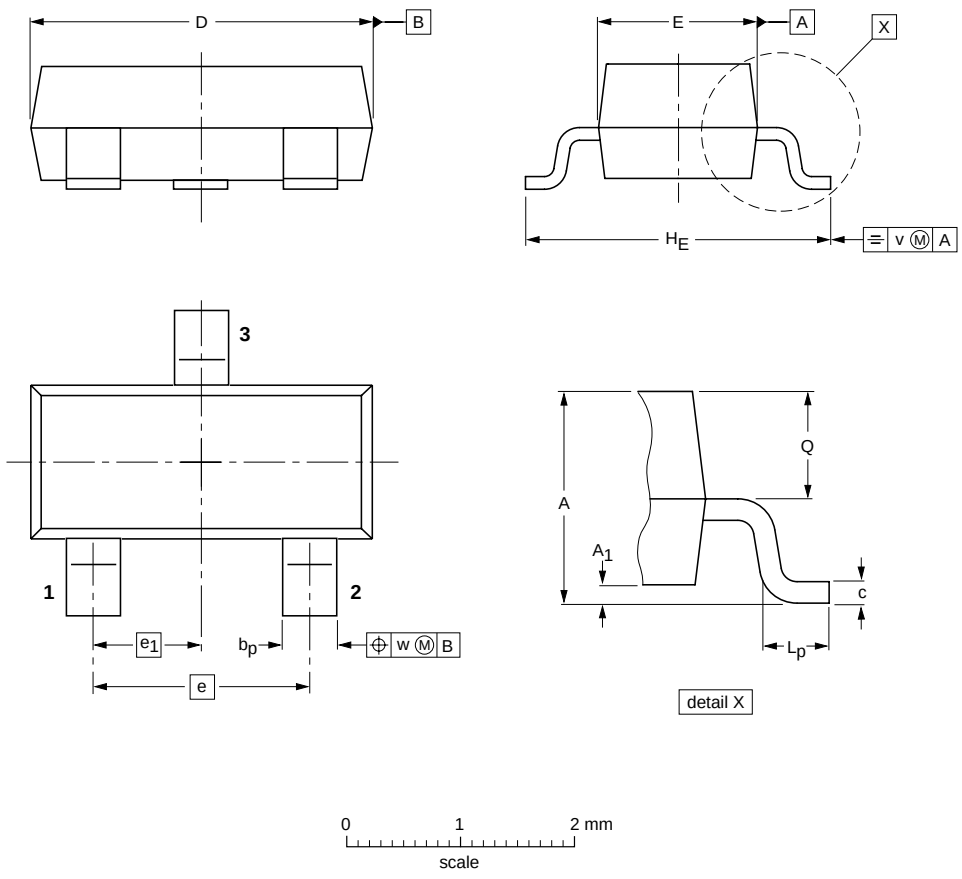


I_C/I_B = 20.
(1) T_{amb} = 150 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = −55 °C.

Fig.7 Equivalent on-resistance as a function of collector current; typical values.

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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2. The product status of the device(s) described in this data sheet may have changed since this data sheet was published. The latest information is available on the Internet at URL http://www.semiconductors.philips.com.
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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