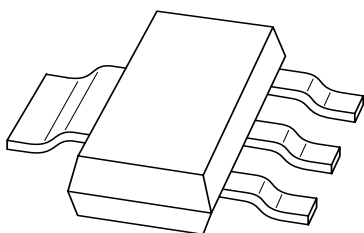


DATA SHEET



BCP68

NPN medium power transistor;
20 V, 1 A

Product specification
Supersedes data of 1999 Apr 08

2003 Nov 25

NPN medium power transistor; 20 V, 1 A

BCP68

FEATURES

- High current
- Two current gain selections
- 1.4 W total power dissipation.

APPLICATIONS

- Linear voltage regulators
- Low side switches
- Supply line switch for negative voltages
- MOSFET drivers
- Audio pre-amplifiers.

DESCRIPTION

NPN medium power transistor (see “Simplified outline, symbol and pinning”) for package details.

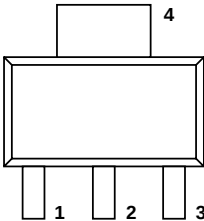
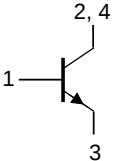
QUICK REFERENCE DATA

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V_{CEO}	collector-emitter voltage	–	20	V
I_C	collector current (DC)	–	1	A
I_{CM}	peak collector current	–	2	A
h_{FE}	DC current gain			
	BCP68	85	375	
	BCP68-25	160	375	

PRODUCT OVERVIEW

TYPE NUMBER	PACKAGE		MARKING CODE
	PHILIPS	EIAJ	
BCP68	SOT223	SC-73	BCP68
BCP68-25	SOT223	SC-73	BCP68/25

SIMPLIFIED OUTLINE, SYMBOL AND PINNING

TYPE NUMBER	SIMPLIFIED OUTLINE AND SYMBOL	PINNING	
		PIN	DESCRIPTION
BCP68	 Top view  MAM287	1 2 3 4	base collector emitter collector

RELATED PRODUCTS

TYPE NUMBER	DESCRIPTION	FEATURE
BCP69	PNP medium power transistor	PNP complement
BC868	NPN medium power transistor	SOT89, 20 V
BC368	NPN medium power transistor	SOT54, 20 V

NPN medium power transistor;
20 V, 1 A

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ORDERING INFORMATION

TYPE NUMBER	PACKAGE		
	NAME	DESCRIPTION	VERSION
BCP68	–	plastic surface mounted package; collector pad for good heat transfer; 4 leads	SOT223
BCP68-25			

LIMITING VALUES

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

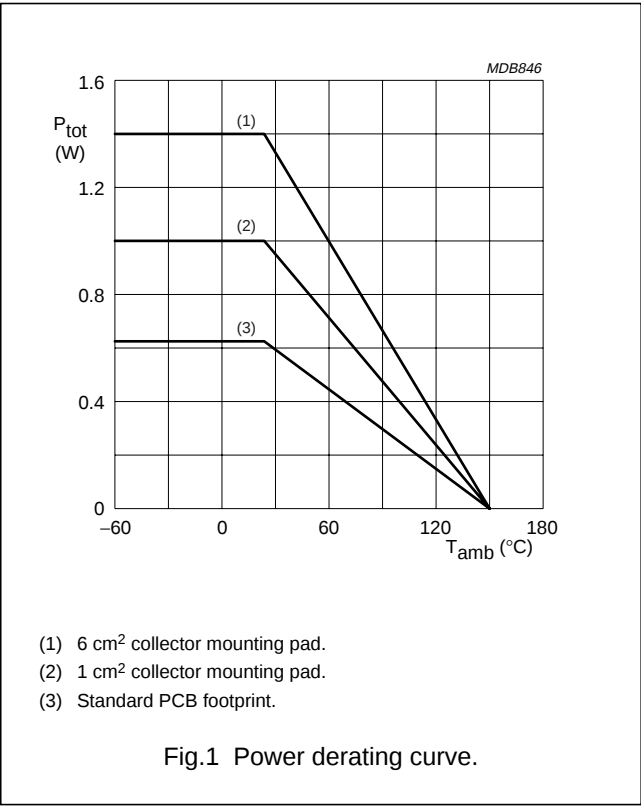
SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{CBO}	collector-base voltage	open emitter	–	32	V
V_{CEO}	collector-emitter voltage	open base	–	20	V
V_{EBO}	emitter-base voltage	open collector	–	5	V
I_C	collector current (DC)		–	1	A
I_{CM}	peak collector current		–	2	A
I_{BM}	peak base current		–	200	mA
P_{tot}	total power dissipation	$T_{amb} \leq 25\text{ °C}$; notes 1 and 2	–	0.625	W
		$T_{amb} \leq 25\text{ °C}$; notes 1 and 3	–	1	W
		$T_{amb} \leq 25\text{ °C}$; notes 1 and 4	–	1.4	W
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C
T_{amb}	operating ambient temperature		–65	+150	°C

Notes

1. See SOT223 (SC-73) standard mounting conditions.
2. Device mounted on a FR4 printed-circuit board; single-sided copper; tinplated; standard footprint for SOT223.
3. Device mounted on a FR4 printed-circuit board; single-sided copper; tinplated; 1 cm² collector mounting pad.
4. Device mounted on a FR4 printed-circuit board; single-sided copper; tinplated; 6 cm² collector mounting pad.

NPN medium power transistor;
20 V, 1 A

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THERMAL CHARACTERISTICS

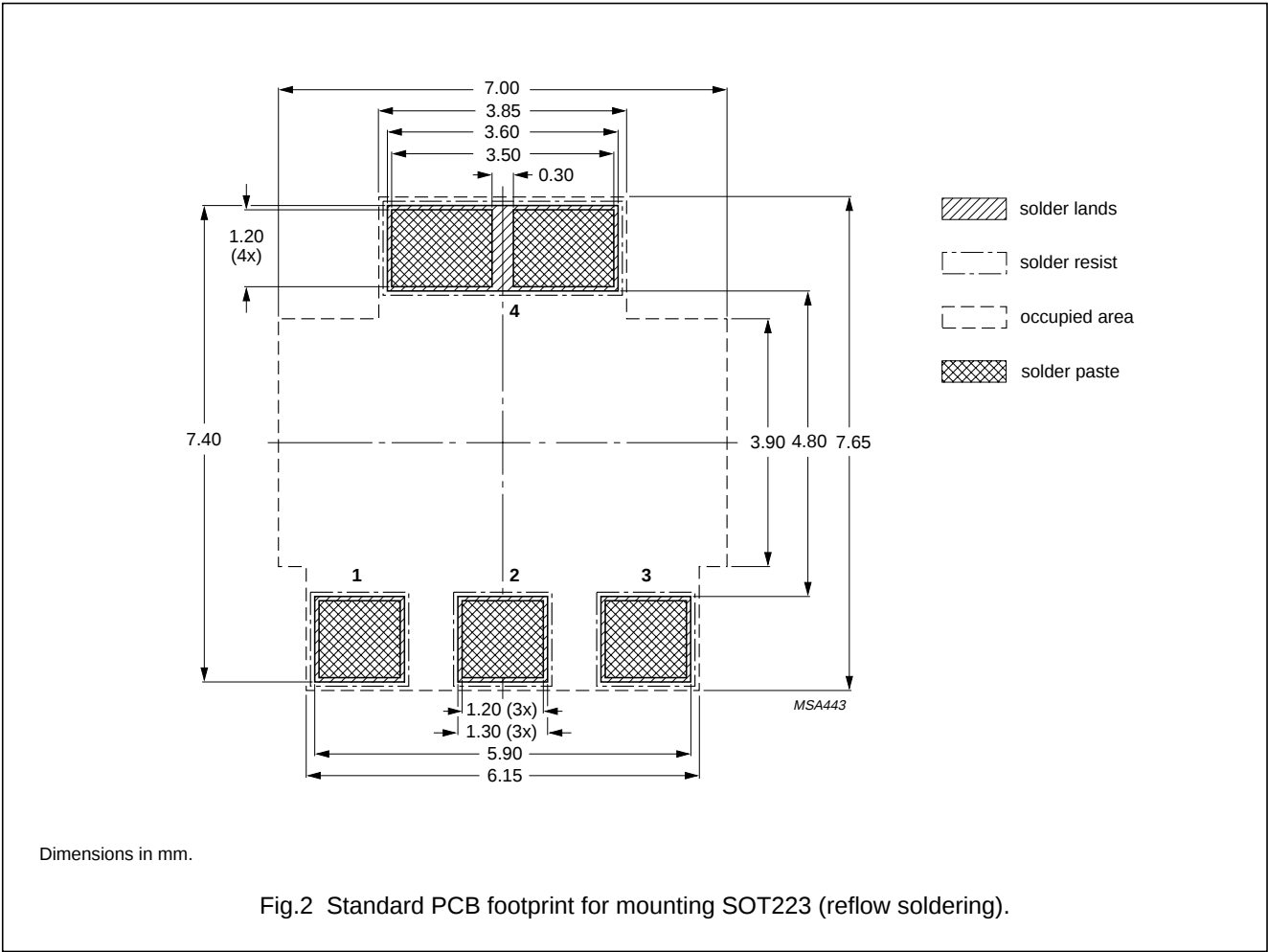
SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th(j-a)}$	thermal resistance from junction to ambient	$T_{amb} \leq 25\text{ °C}$; notes 1 and 3	200	K/W
		$T_{amb} \leq 25\text{ °C}$; notes 1 and 4	125	K/W
		$T_{amb} \leq 25\text{ °C}$; notes 1 and 4	89	K/W
$R_{th(j-s)}$	thermal resistance from junction to solder point	$T_{amb} \leq 25\text{ °C}$	15	K/W

Notes

1. See SOT223 (SC-73) standard mounting conditions.
2. Device mounted on a FR4 printed-circuit board; single-sided copper; tinplated; standard footprint for SOT223.
3. Device mounted on a FR4 printed-circuit board; single-sided copper; tinplated; 1 cm² collector mounting pad.
4. Device mounted on a FR4 printed-circuit board; single-sided copper; tinplated; 6 cm² collector mounting pad.

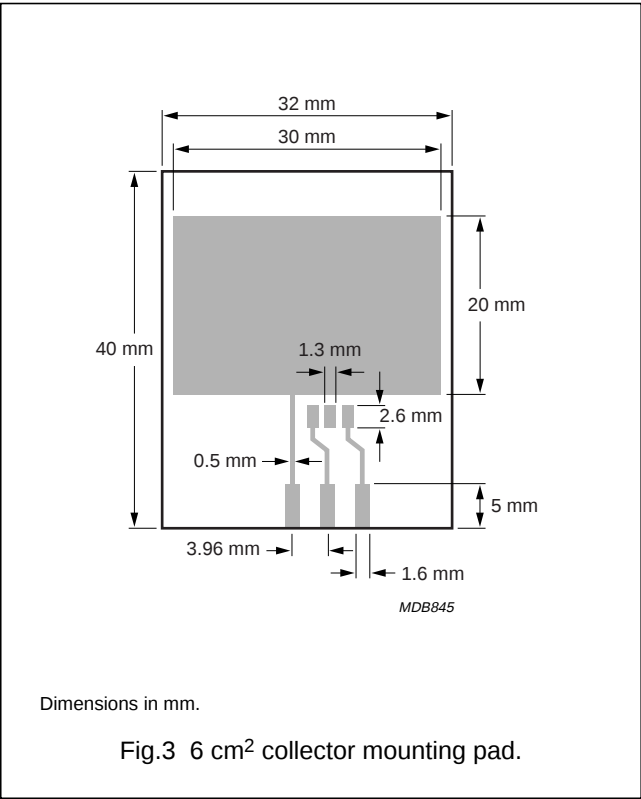
NPN medium power transistor;
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NPN medium power transistor;
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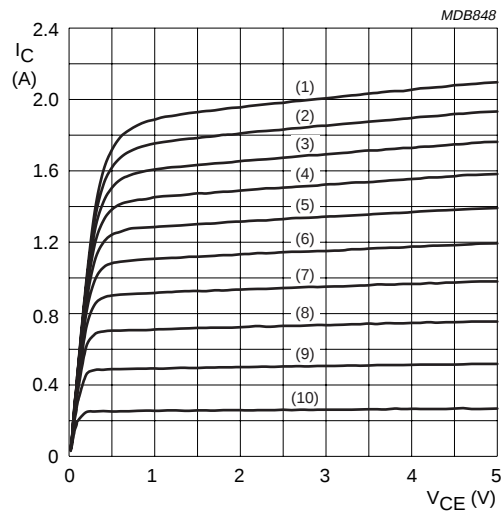
CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I _{CBO}	collector-base cut-off current	V _{CB} = 25 V; I _E = 0	–	–	100	nA
		V _{CB} = 25 V; I _E = 0; T _j = 150 °C	–	–	10	μA
I _{EBO}	emitter-base cut-off current	V _{EB} = 5 V; I _C = 0	–	–	100	nA
h _{FE}	DC current gain	BCP68				
		V _{CE} = 10 V; I _C = 5 mA	50	–	–	
		V _{CE} = 1 V; I _C = 500 mA	85	–	375	
		V _{CE} = 1 V; I _C = 1 A	60	–	–	
		BCP68-25				
		V _{CE} = 1 V; I _C = 500 mA	160	–	375	
V _{CEsat}	collector-emitter saturation voltage	I _C = 1 A; I _B = 100 mA	–	–	500	mV
V _{BE}	base-emitter voltage	V _{CE} = 10 V; I _C = 5 mA	–	–	700	mV
		V _{CE} = 1 V; I _C = 1 A	–	–	1	V
C _c	collector capacitance	V _{CB} = 10 V; I _E = I _e = 0; f = 1 MHz	–	22	–	pF
f _T	transition frequency	V _{CE} = 5 V; I _C = 50 mA; f = 100 MHz	40	170	–	MHz

NPN medium power transistor;
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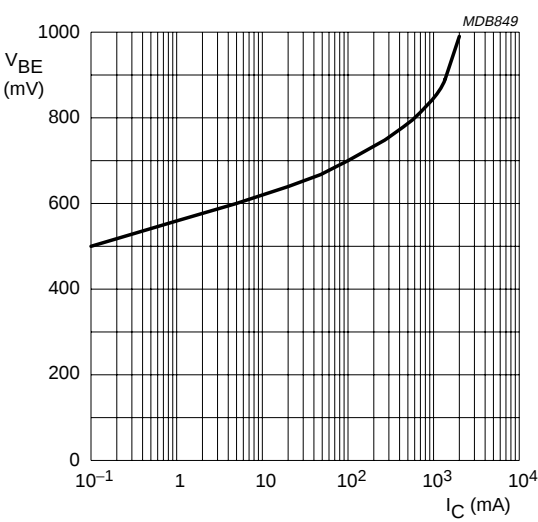
BCP68



$T_{amb} = 25\text{ }^{\circ}\text{C}.$

- | | |
|---------------------------|---------------------------|
| (1) $I_B = 10\text{ mA}.$ | (6) $I_B = 5\text{ mA}.$ |
| (2) $I_B = 9\text{ mA}.$ | (7) $I_B = 4\text{ mA}.$ |
| (3) $I_B = 8\text{ mA}.$ | (8) $I_B = 3\text{ mA}.$ |
| (4) $I_B = 7\text{ mA}.$ | (9) $I_B = 2\text{ mA}.$ |
| (5) $I_B = 6\text{ mA}.$ | (10) $I_B = 1\text{ mA}.$ |

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

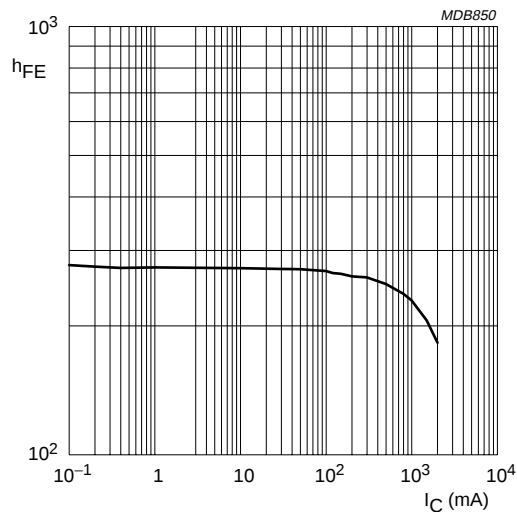


$V_{BE}/V_{CE} = 1\text{ V}.$

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

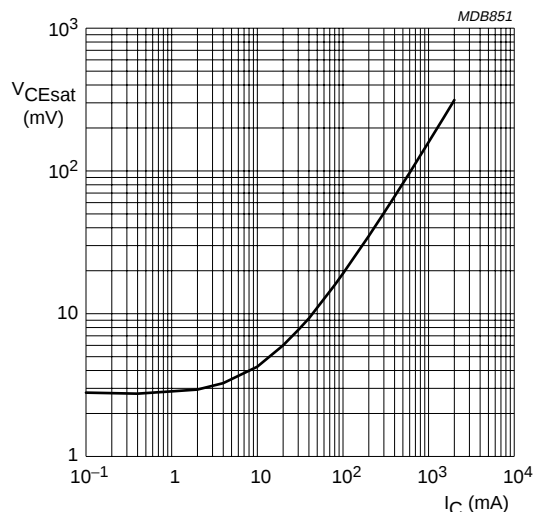
NPN medium power transistor;
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$h_{FE}/V_{CE} = 1 \text{ V.}$

Fig.6 DC current gain as a function of collector current; typical values.

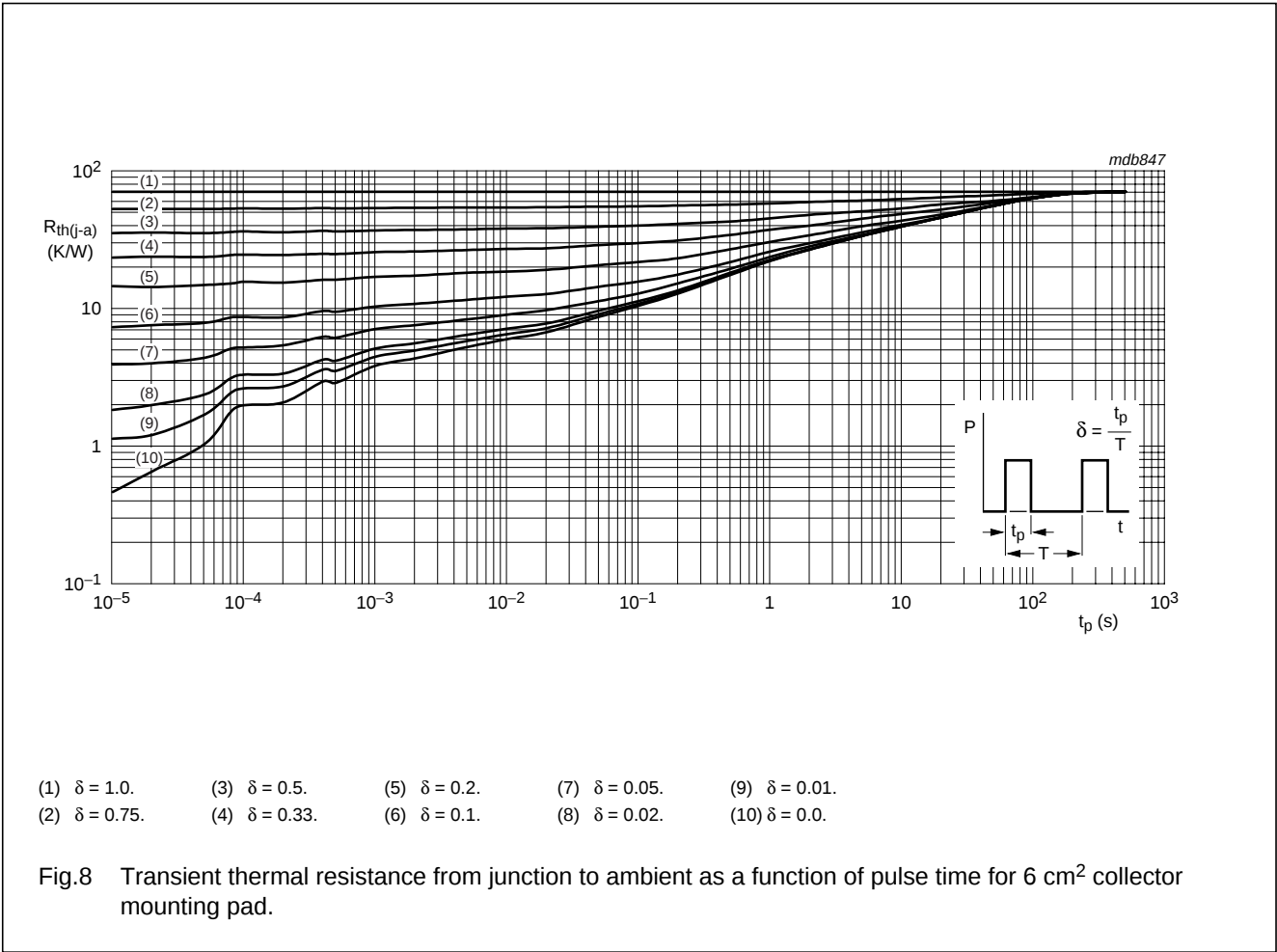


$I_C/I_B = 10.$

Fig.7 Collector-emitter saturation voltage as a function of collector current; typical values.

NPN medium power transistor;
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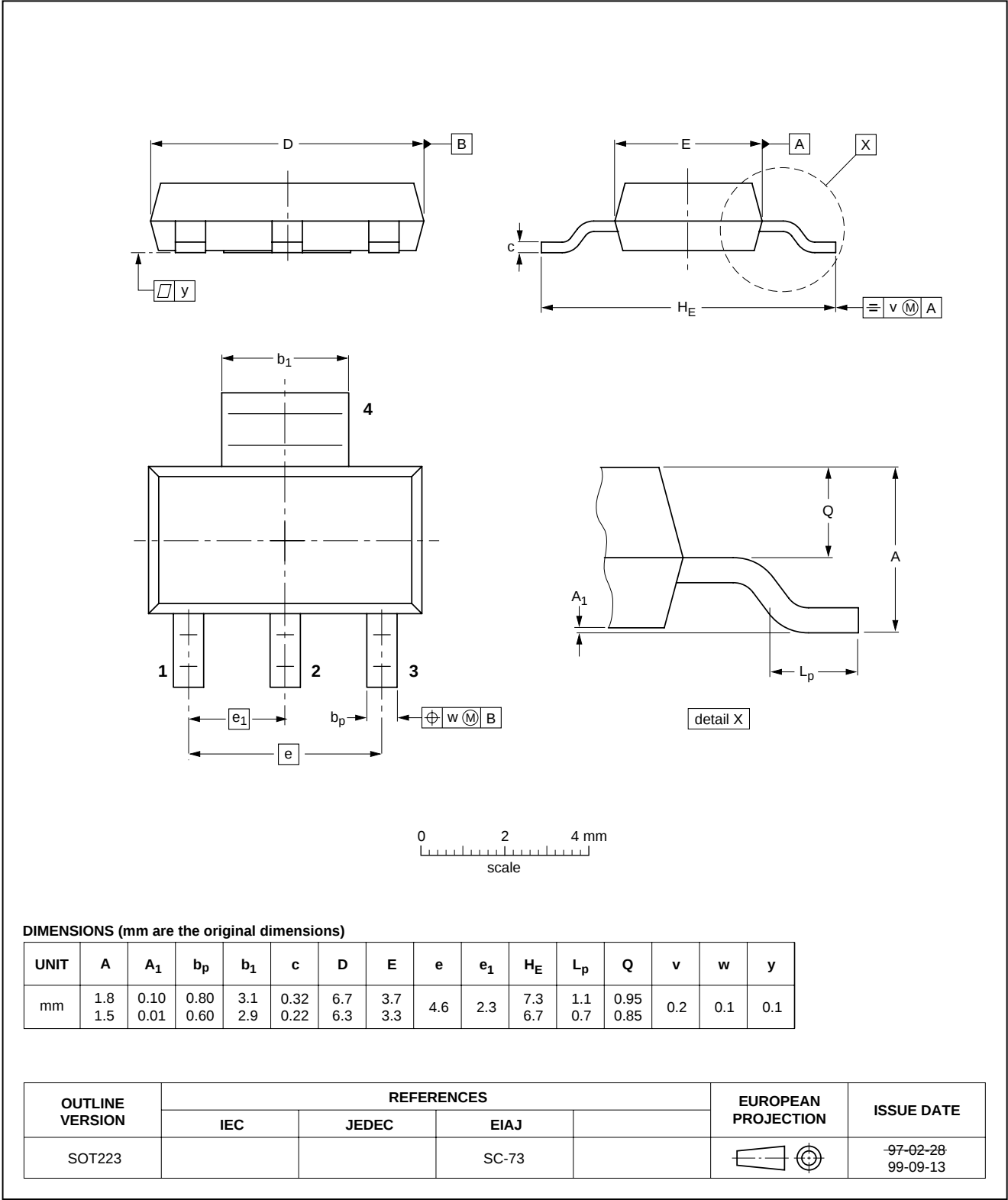
NPN medium power transistor;
20 V, 1 A

BCP68

PACKAGE OUTLINE

Plastic surface mounted package; collector pad for good heat transfer; 4 leads

SOT223



NPN medium power transistor; 20 V, 1 A

BCP68

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.
II	Preliminary data	Qualification	This data sheet contains data from the preliminary specification. Supplementary data will be published at a later date. Philips Semiconductors reserves the right to change the specification without notice, in order to improve the design and supply the best possible product.
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.

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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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Printed in The Netherlands

R75/04/pp12

Date of release: 2003 Nov 25

Document order number: 9397 750 12041

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