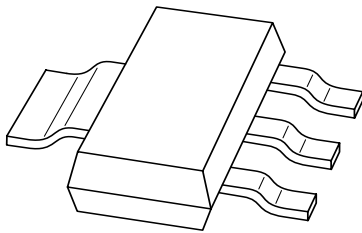


DATA SHEET



BCP68

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

Product data sheet
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.

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	

DESCRIPTION

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

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	<p>Top view MAM287</p>	1	base
		2	collector
		3	emitter
		4	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

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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).

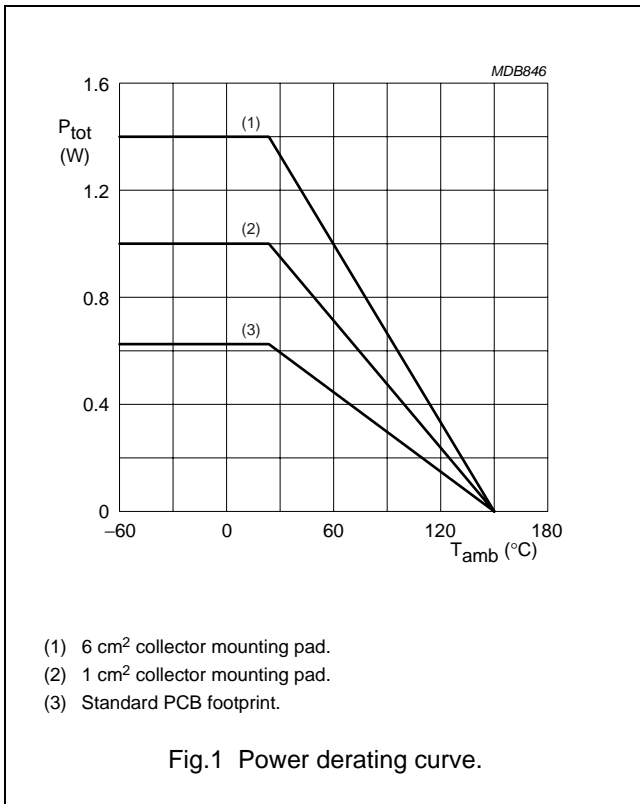
SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{CBO}	collector-base voltage	open emitter	–	32	V
V_{CEO}	collector-emitter voltage	open base	–	20	V
V_{EBO}	emitter-base voltage	open collector	–	5	V
I_C	collector current (DC)		–	1	A
I_{CM}	peak collector current		–	2	A
I_{BM}	peak base current		–	200	mA
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.

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THERMAL CHARACTERISTICS

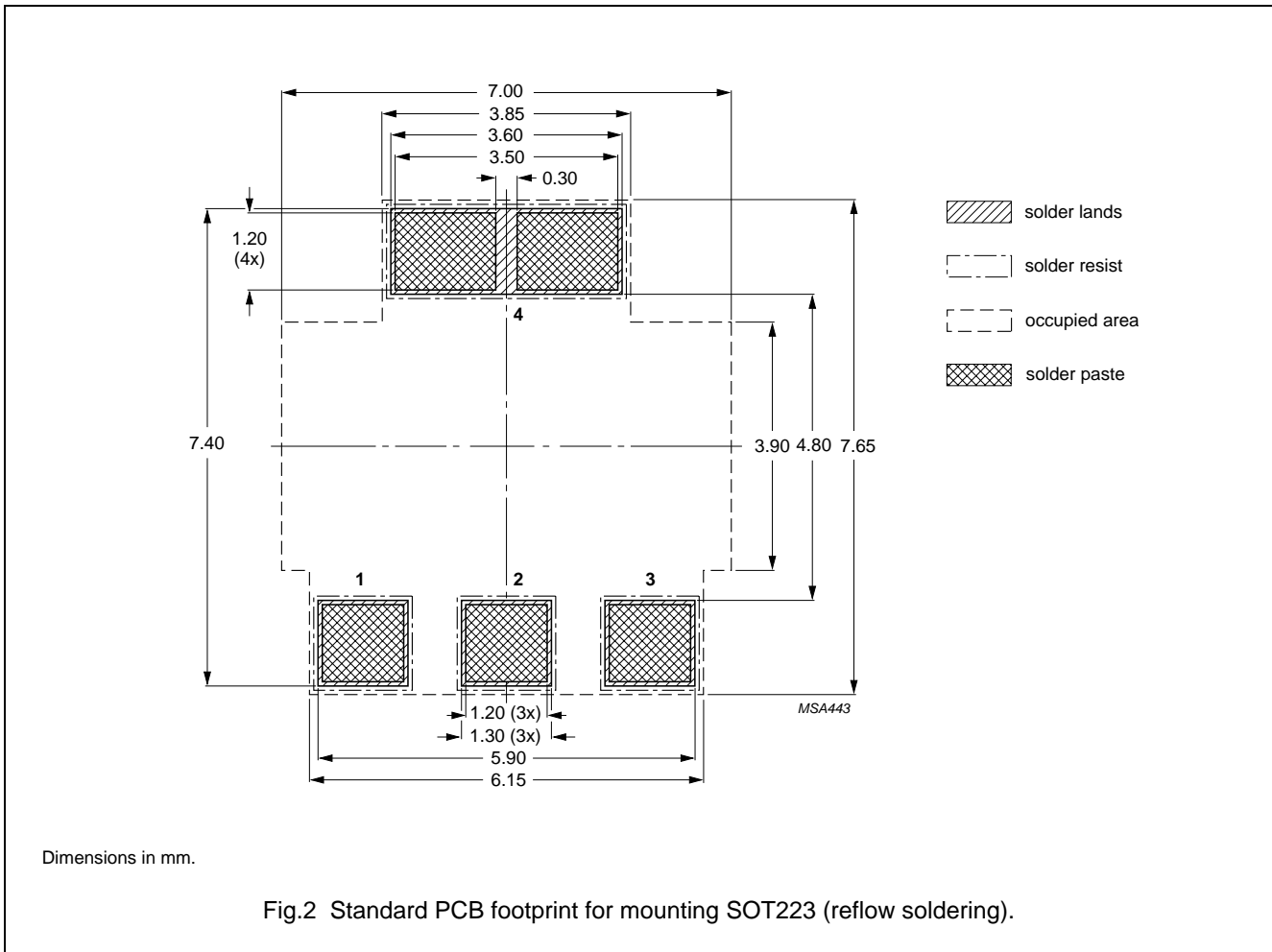
SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
R _{th(j-a)}	thermal resistance from junction to ambient	T _{amb} ≤ 25 °C; notes 1 and 3	200	K/W
		T _{amb} ≤ 25 °C; notes 1 and 4	125	K/W
		T _{amb} ≤ 25 °C; notes 1 and 4	89	K/W
R _{th(j-s)}	thermal resistance from junction to solder point	T _{amb} ≤ 25 °C	15	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.

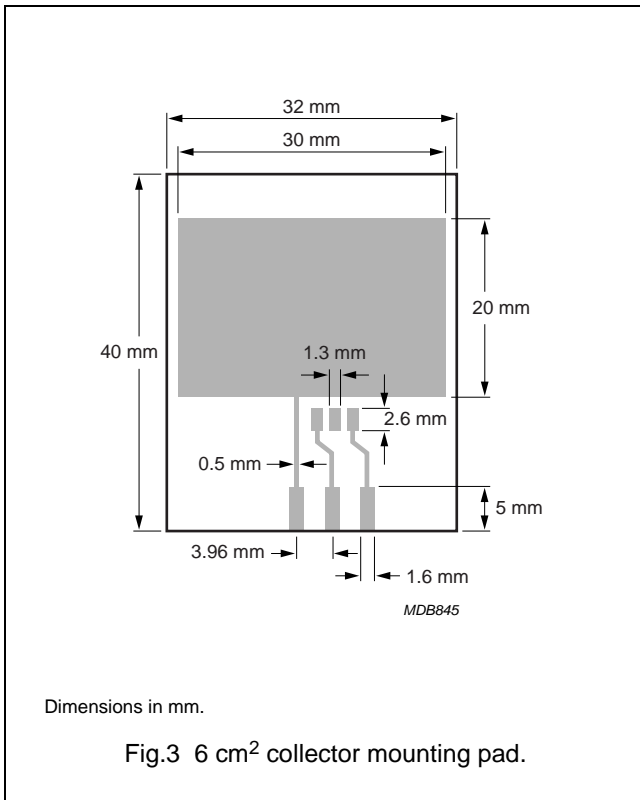
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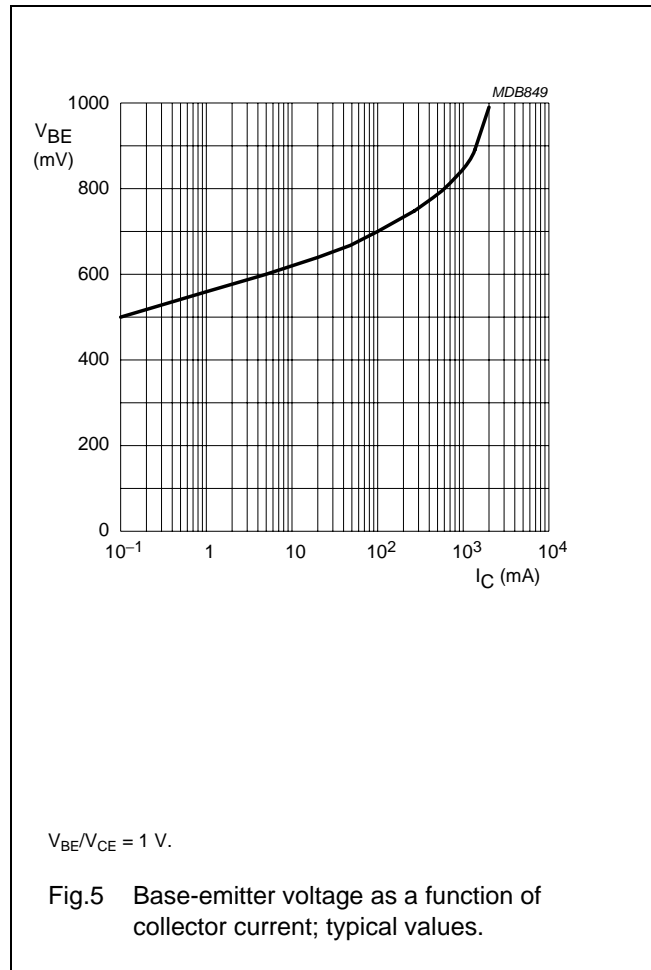
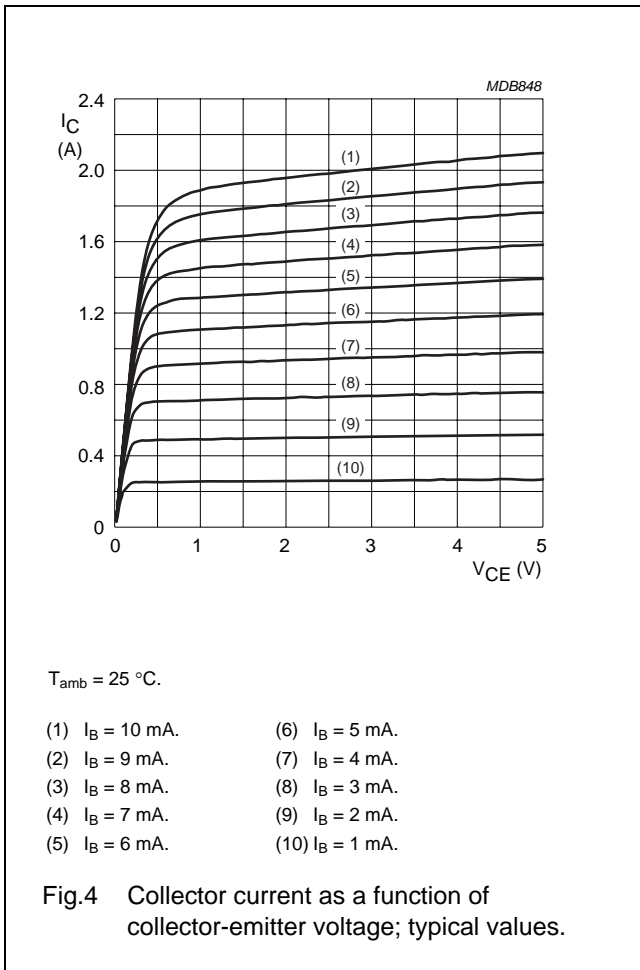
CHARACTERISTICS

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

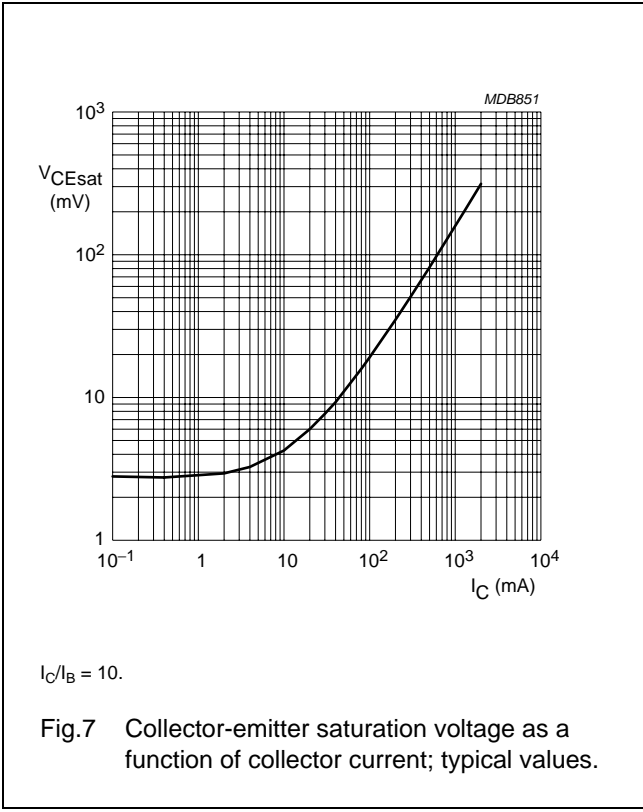
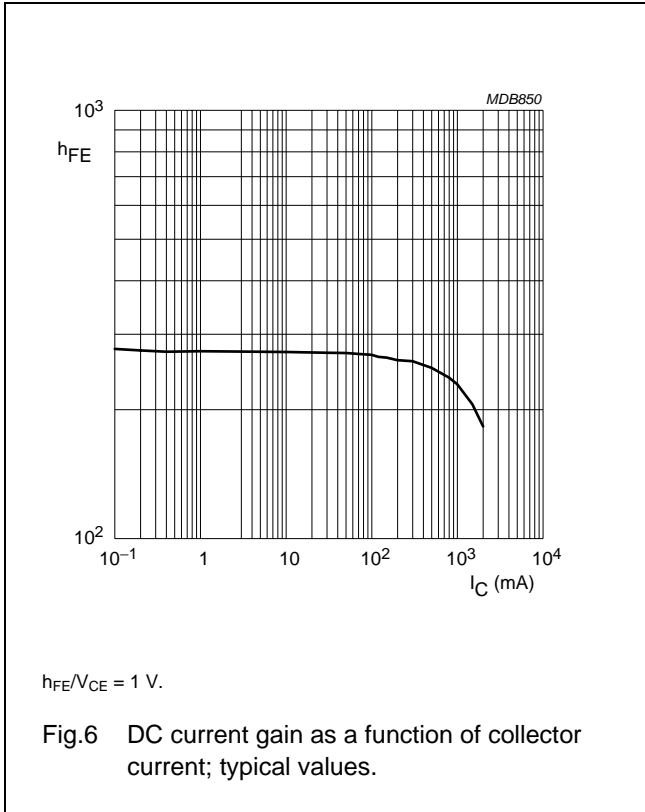
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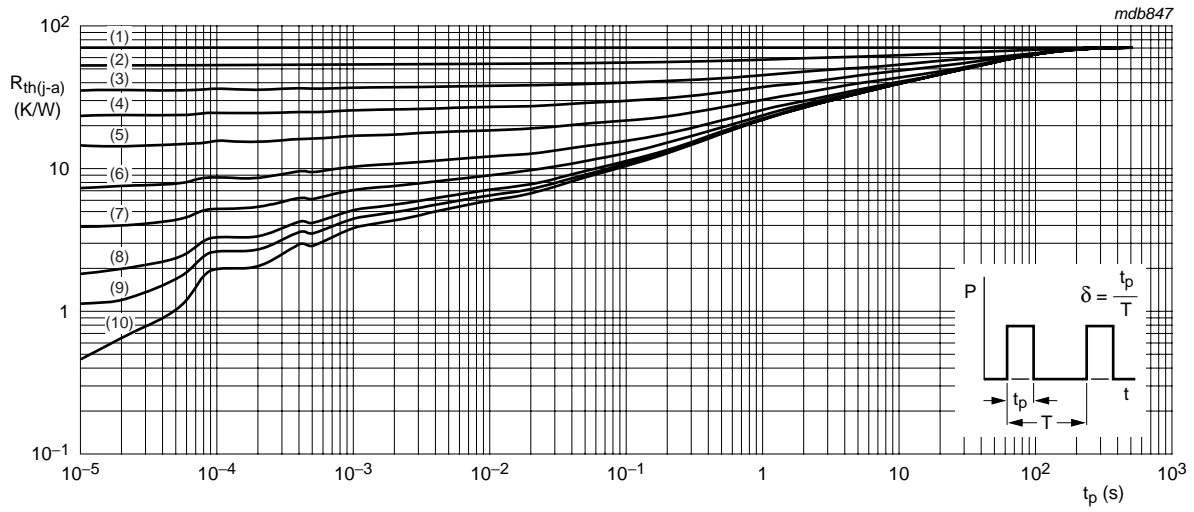
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- (1) $\delta = 1.0.$ (3) $\delta = 0.5.$ (5) $\delta = 0.2.$ (7) $\delta = 0.05.$ (9) $\delta = 0.01.$
- (2) $\delta = 0.75.$ (4) $\delta = 0.33.$ (6) $\delta = 0.1.$ (8) $\delta = 0.02.$ (10) $\delta = 0.0.$

Fig.8 Transient thermal resistance from junction to ambient as a function of pulse time for 6 cm² collector mounting pad.

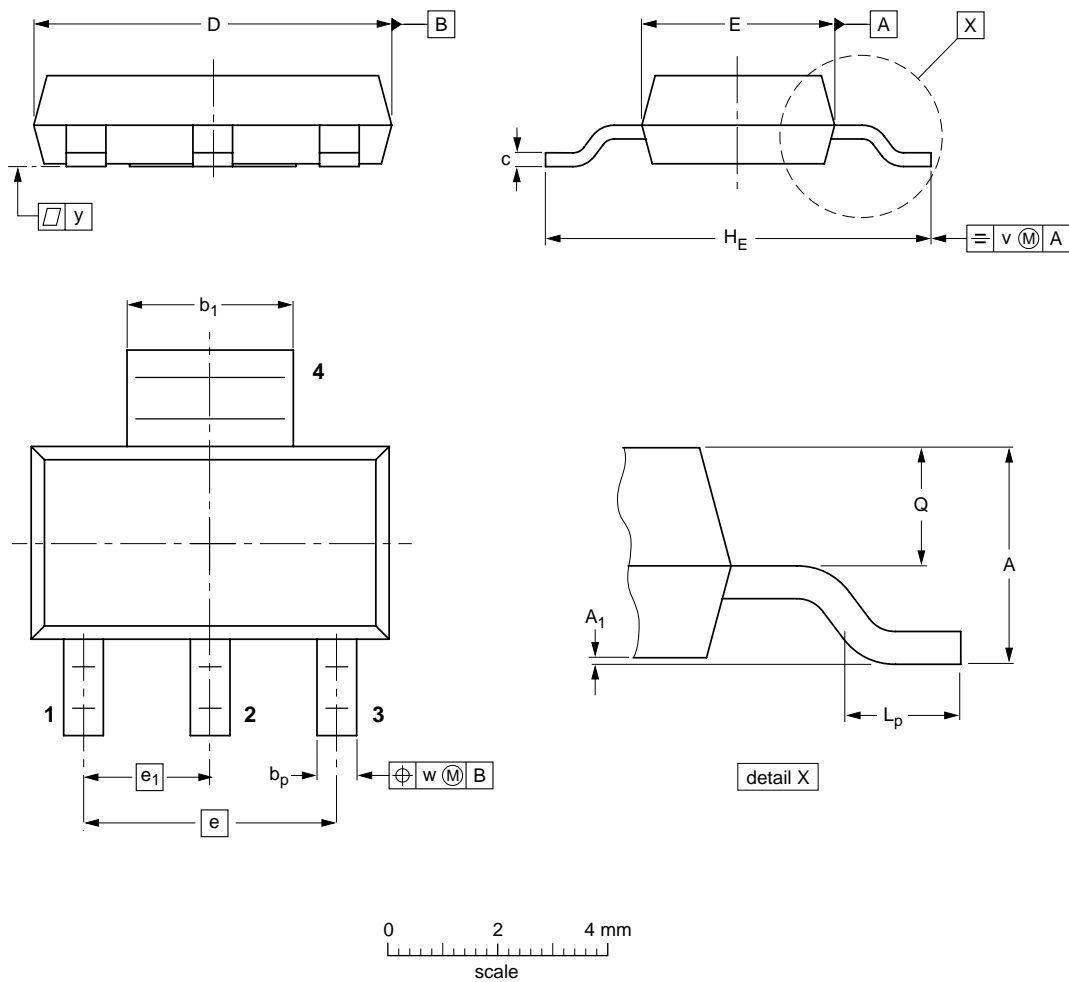
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PACKAGE OUTLINE

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

SOT223



DIMENSIONS (mm are the original dimensions)

UNIT	A	A ₁	b _p	b ₁	c	D	E	e	e ₁	H _E	L _p	Q	v	w	y
mm	1.8	0.10	0.80	3.1	0.32	6.7	3.7	4.6	2.3	7.3	1.1	0.95	0.2	0.1	0.1
	1.5	0.01	0.60	2.9	0.22	6.3	3.3			6.7	0.7	0.85			

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT223			SC-73			97-02-28 99-09-13

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DATA SHEET STATUS

DOCUMENT STATUS ⁽¹⁾	PRODUCT STATUS ⁽²⁾	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.

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2. The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the Internet at URL <http://www.nxp.com>.

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