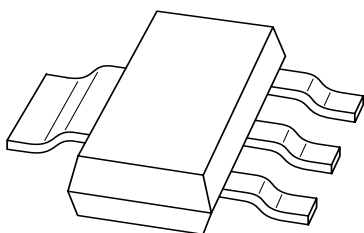


DATA SHEET



BCP69

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

Product specification
Supersedes data of 2002 Nov 15

2003 Nov 25

PNP medium power transistor; 20 V, 1 A

BCP69

FEATURES

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

APPLICATIONS

- Linear voltage regulators (LDO)
- High side switches
- Supply line switches
- 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			
	BCP69	85	375	
	BCP69-16	100	250	
	BCP69-16/IN	140	230	
	BCP69-25	160	375	

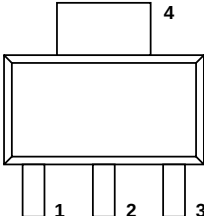
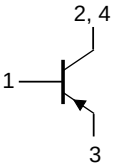
DESCRIPTION

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

PRODUCT OVERVIEW

TYPE NUMBER	PACKAGE		MARKING CODE
	PHILIPS	EIAJ	
BCP69	SOT223	SC-73	BCP69
BCP69-16	SOT223	SC-73	BCP69/16
BCP69-16/IN	SOT223	SC-73	69-16N
BCP69-25	SOT223	SC-73	BCP69/25

SIMPLIFIED OUTLINE, SYMBOL AND PINNING

TYPE NUMBER	SIMPLIFIED OUTLINE AND SYMBOL	PINNING	
		PIN	DESCRIPTION
BCP69	 Top view  MAM288	1 2 3 4	base collector emitter collector

PNP medium power transistor; 20 V, 1 A

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RELATED PRODUCTS

TYPE NUMBER	DESCRIPTION	FEATURE
BCP68	NPN medium power transistor	NPN complement
BC869	PNP medium power transistor	SOT89, –20 V
BC369	PNP medium power transistor	SOT54, –20 V

ORDERING INFORMATION

TYPE NUMBER	PACKAGE		
	NAME	DESCRIPTION	VERSION
BCP69	–	plastic surface mounted package; collector pad for good heat transfer; 4 leads	SOT223
BCP69-16			
BCP69-16/IN			
BCP69-25			

LIMITING VALUES

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

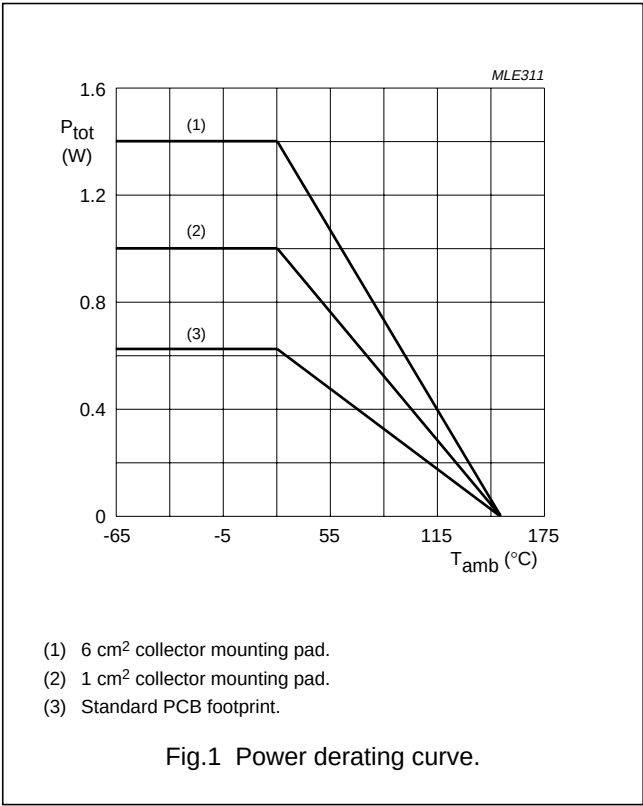
SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{CBO}	collector-base voltage	open emitter	–	–32	V
V_{CEO}	collector-emitter voltage	open base	–	–20	V
V_{EBO}	emitter-base voltage	open collector	–	–5	V
I_C	collector current (DC)		–	–1	A
I_{CM}	peak collector current		–	–2	A
I_{BM}	peak base current		–	–200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

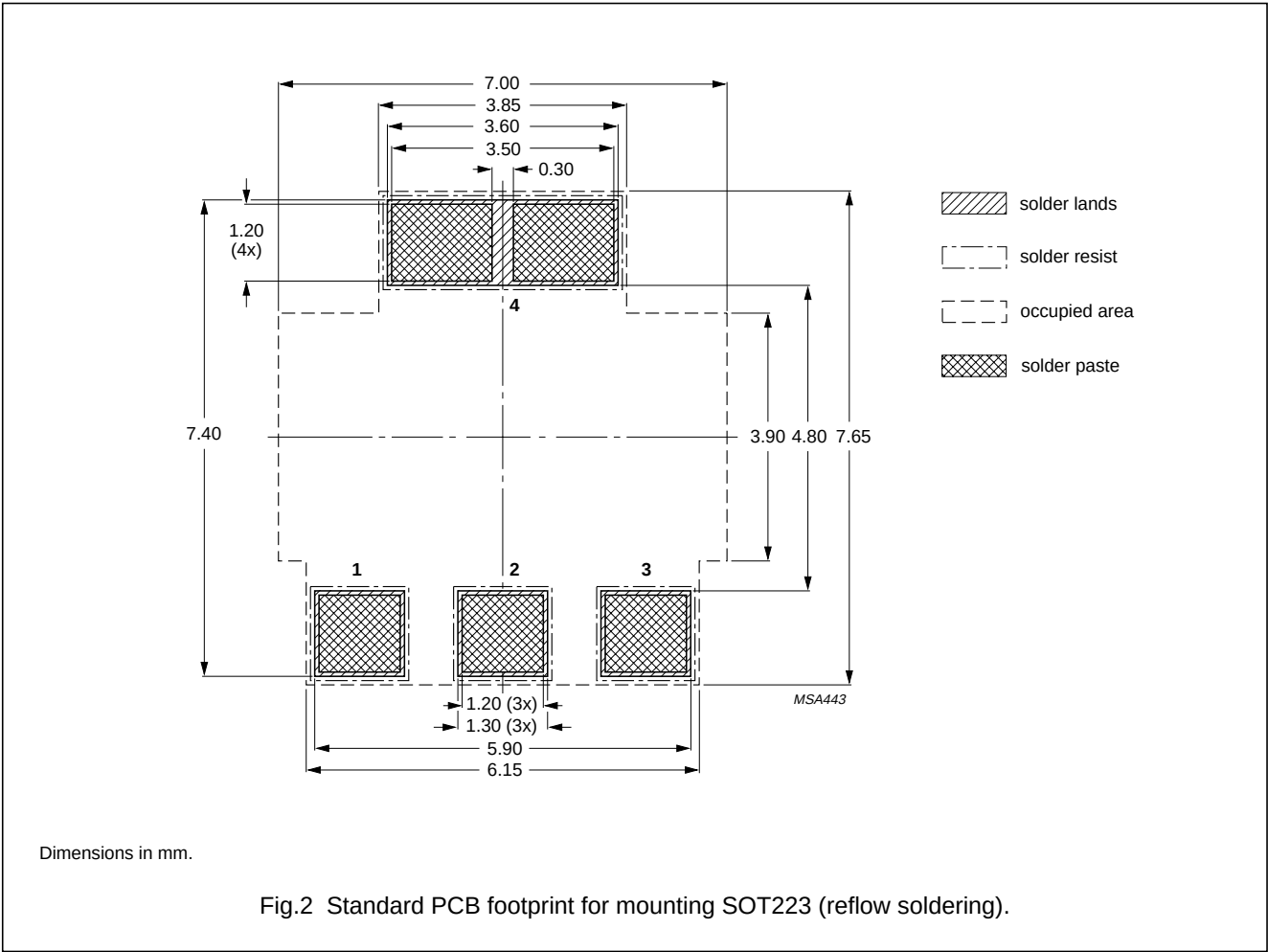
SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
R _{th(j-a)}	thermal resistance from junction to ambient	T _{amb} ≤ 25 °C; notes 1 and 2	200	K/W
		T _{amb} ≤ 25 °C; notes 1 and 3	125	K/W
		T _{amb} ≤ 25 °C; notes 1 and 4	89	K/W
R _{th(j-s)}	thermal resistance from junction to solder point	T _{amb} ≤ 25 °C	15	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.

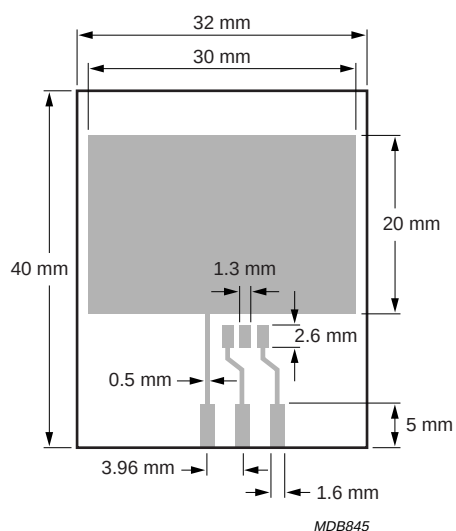
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PNP medium power transistor; 20 V, 1 A

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Dimensions in mm.

Fig.3 6 cm² collector mounting pad.

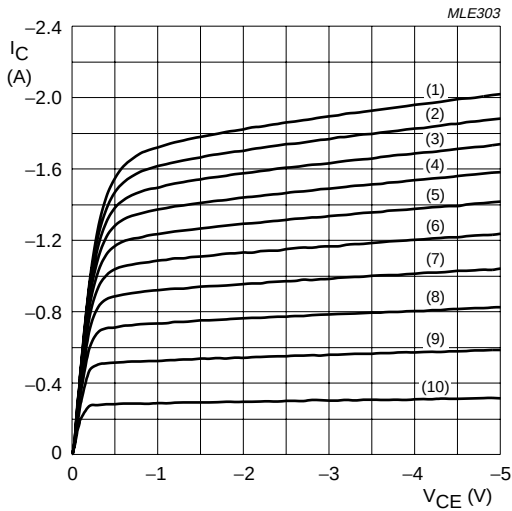
CHARACTERISTICS

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	BCP69 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	—	—	
		BCP69-16 V _{CE} = -1 V; I _C = -500 mA	100	—	250	
		BCP69-16/IN V _{CE} = -1 V; I _C = -500 mA	140		230	
		BCP69-25 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	—	28	—	pF
f _T	transition frequency	V _{CE} = -5 V; I _C = -50 mA; f = 100 MHz	40	140	—	MHz

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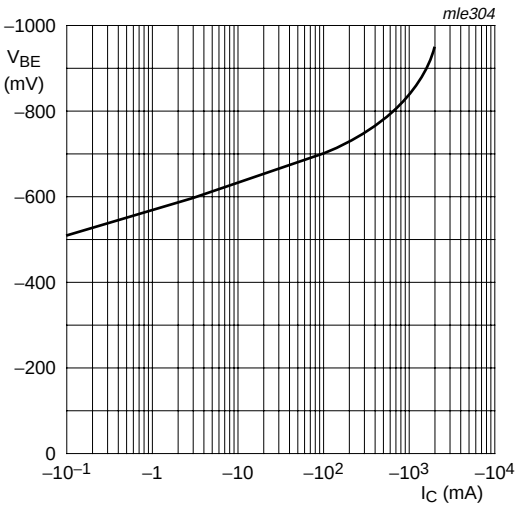


BCP69-16.

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

- | | |
|-------------------------------|-------------------------------|
| (1) $I_B = -18.0\text{ mA}$. | (6) $I_B = -9.0\text{ mA}$. |
| (2) $I_B = -16.2\text{ mA}$. | (7) $I_B = -7.2\text{ mA}$. |
| (3) $I_B = -14.4\text{ mA}$. | (8) $I_B = -5.4\text{ mA}$. |
| (4) $I_B = -12.6\text{ mA}$. | (9) $I_B = -3.6\text{ mA}$. |
| (5) $I_B = -10.8\text{ mA}$. | (10) $I_B = -1.8\text{ mA}$. |

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



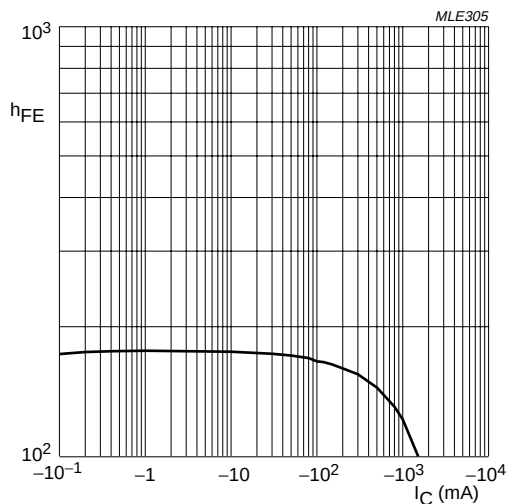
BCP69-16.

$V_{CE} = -1\text{ V}$.

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

PNP medium power transistor;
20 V, 1 A

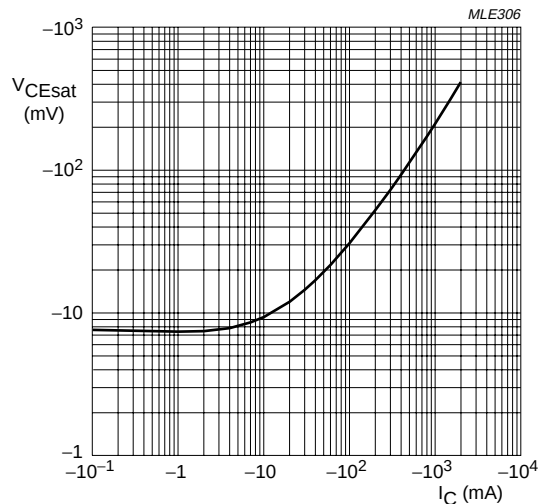
BCP69



BCP69-16.

$V_{CE} = -1$ V.

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



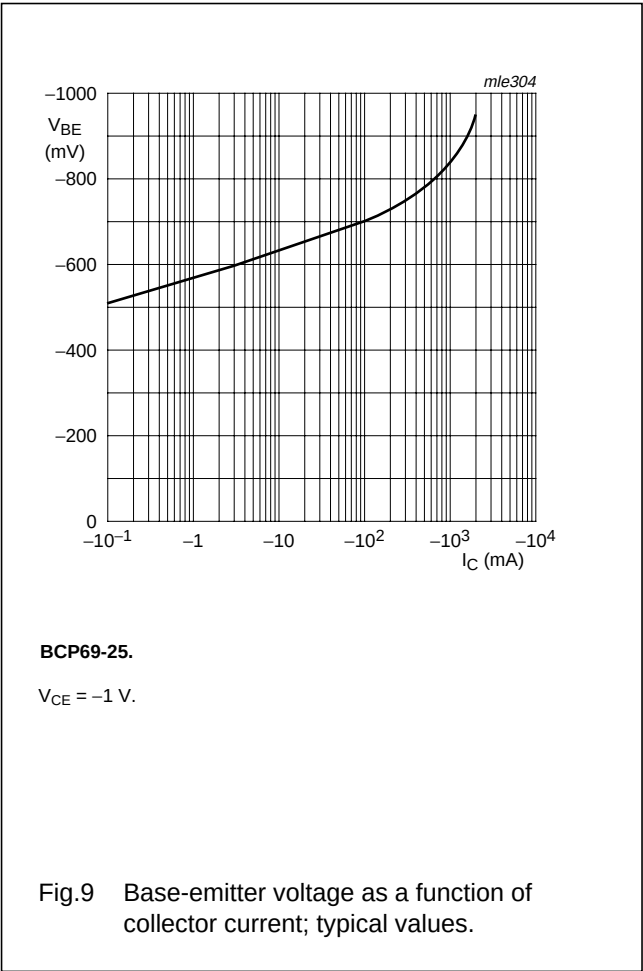
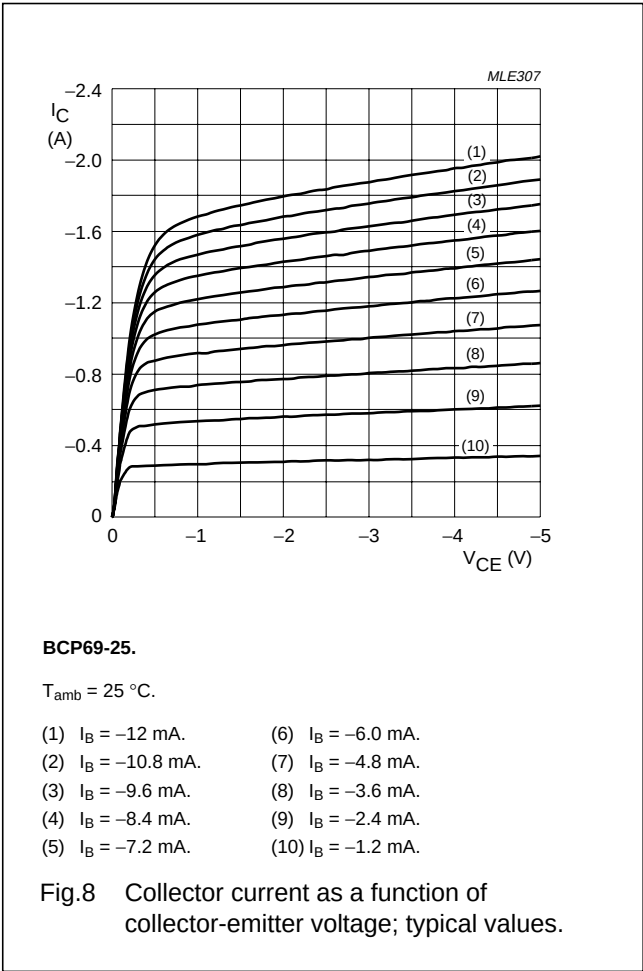
BCP69-16.

$I_C/I_B = 10$.

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

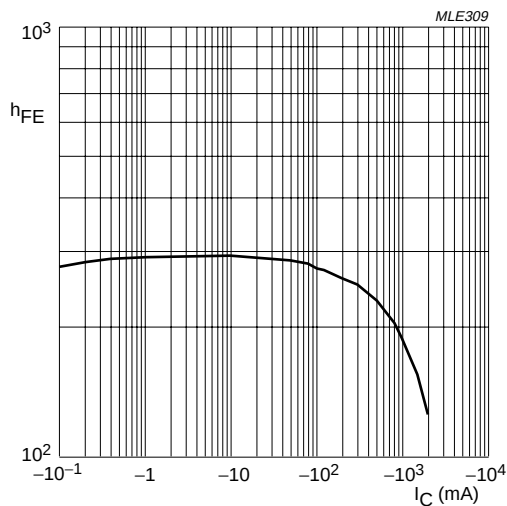
PNP medium power transistor;
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PNP medium power transistor;
20 V, 1 A

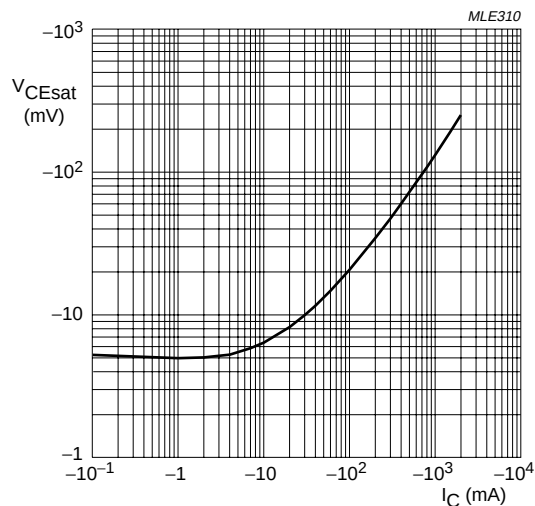
BCP69



BCP69-25.

$V_{CE} = -1$ V.

Fig.10 DC current gain as a function of collector current; typical values.



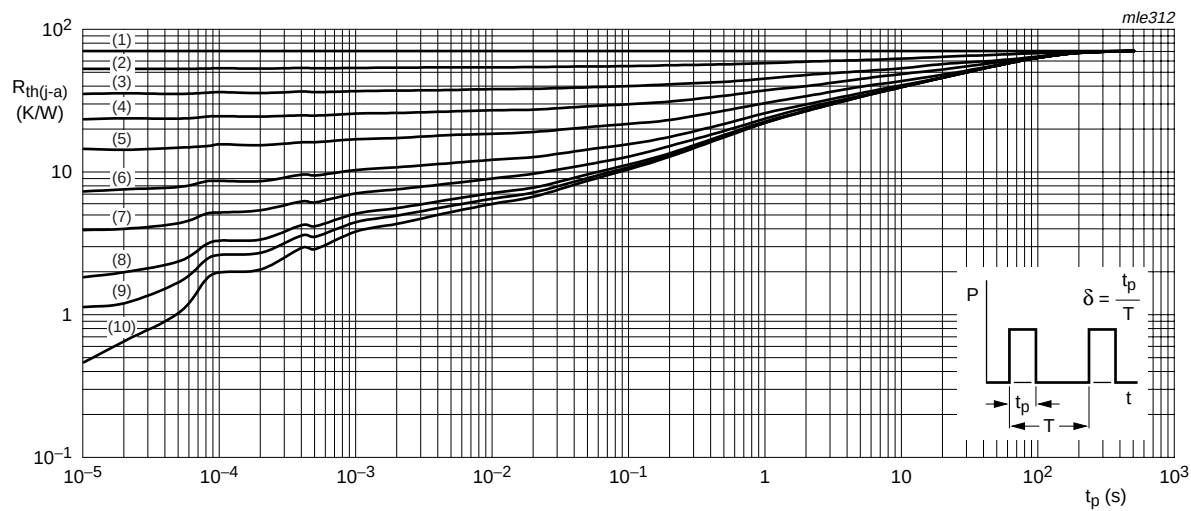
BCP69-25.

$I_C/I_B = 10$.

Fig.11 Collector-emitter saturation voltage as a function of collector current; typical values.

PNP medium power transistor;
20 V, 1 A

BCP69



- | | | | | |
|-----------------------|-----------------------|----------------------|-----------------------|-----------------------|
| (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.12 Transient thermal resistance from junction to ambient as a function of pulse time for 6 cm² collector mounting pad.

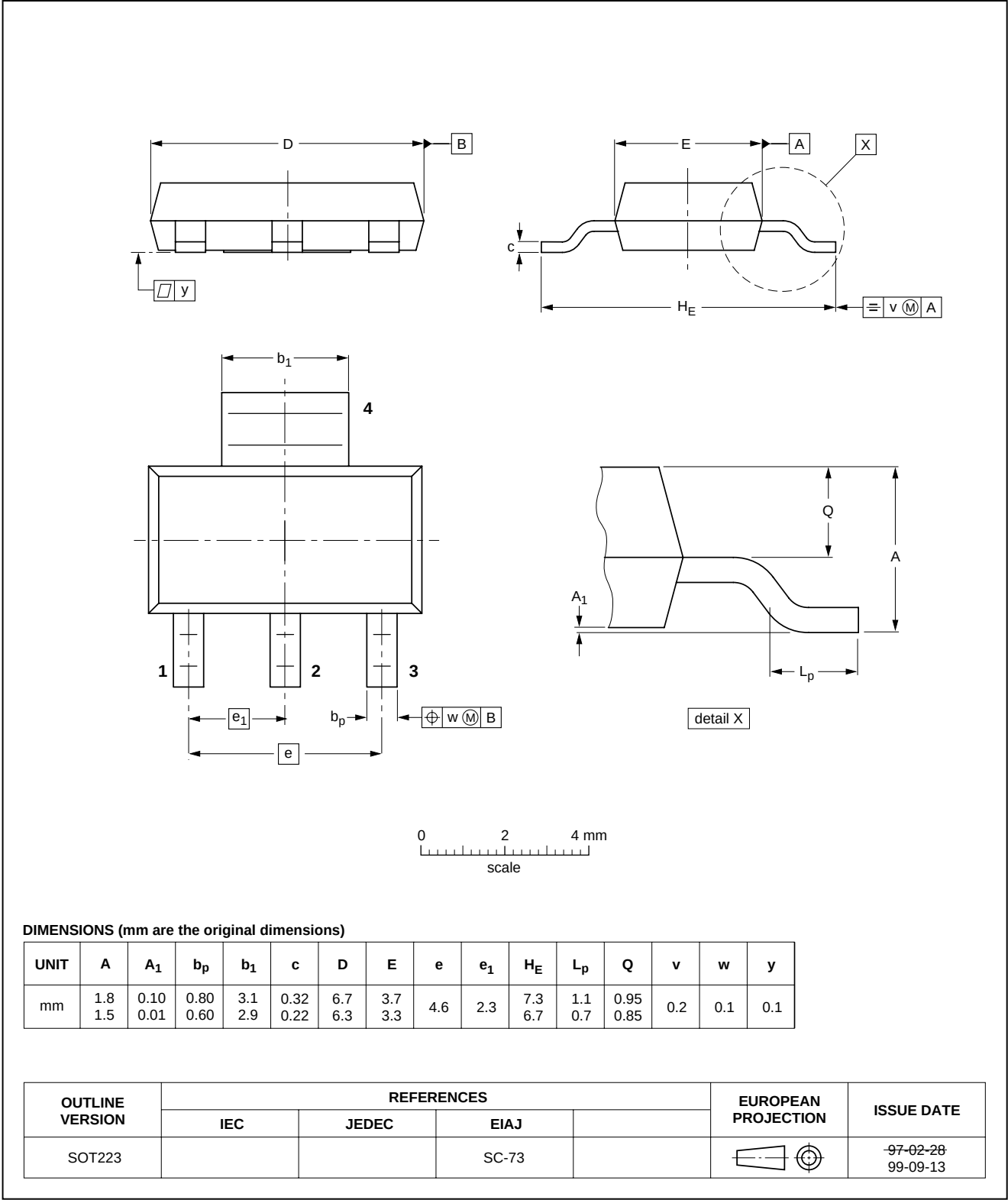
PNP medium power transistor;
20 V, 1 A

BCP69

PACKAGE OUTLINE

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

SOT223



PNP medium power transistor; 20 V, 1 A

BCP69

DATA SHEET STATUS

LEVEL	DATA SHEET STATUS ⁽¹⁾	PRODUCT STATUS ⁽²⁾⁽³⁾	DEFINITION
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