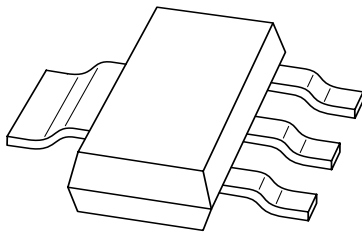


DATA SHEET



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	<p>Top view</p> <p>MAM288</p>	1	base
		2	collector
		3	emitter
		4	collector

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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).

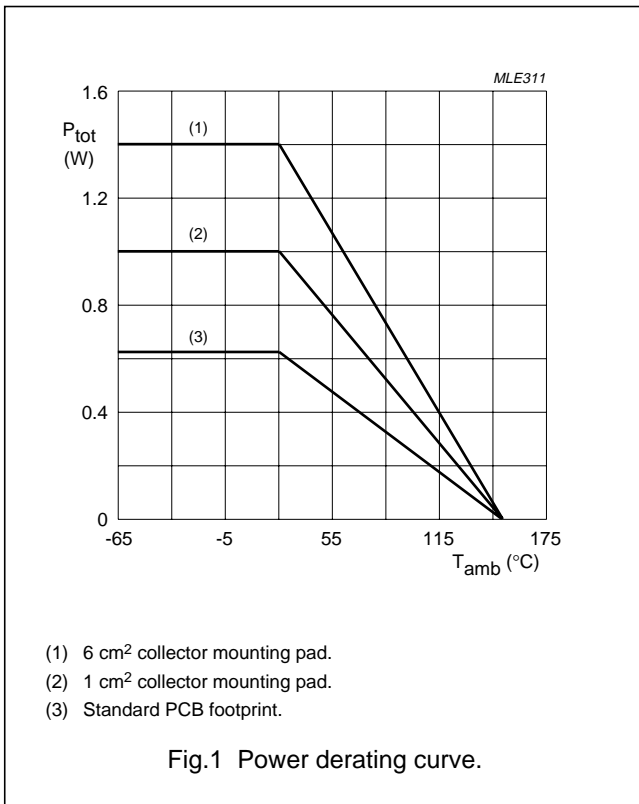
SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{CBO}	collector-base voltage	open emitter	-	-32	V
V_{CEO}	collector-emitter voltage	open base	-	-20	V
V_{EBO}	emitter-base voltage	open collector	-	-5	V
I_C	collector current (DC)		-	-1	A
I_{CM}	peak collector current		-	-2	A
I_{BM}	peak base current		-	-200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

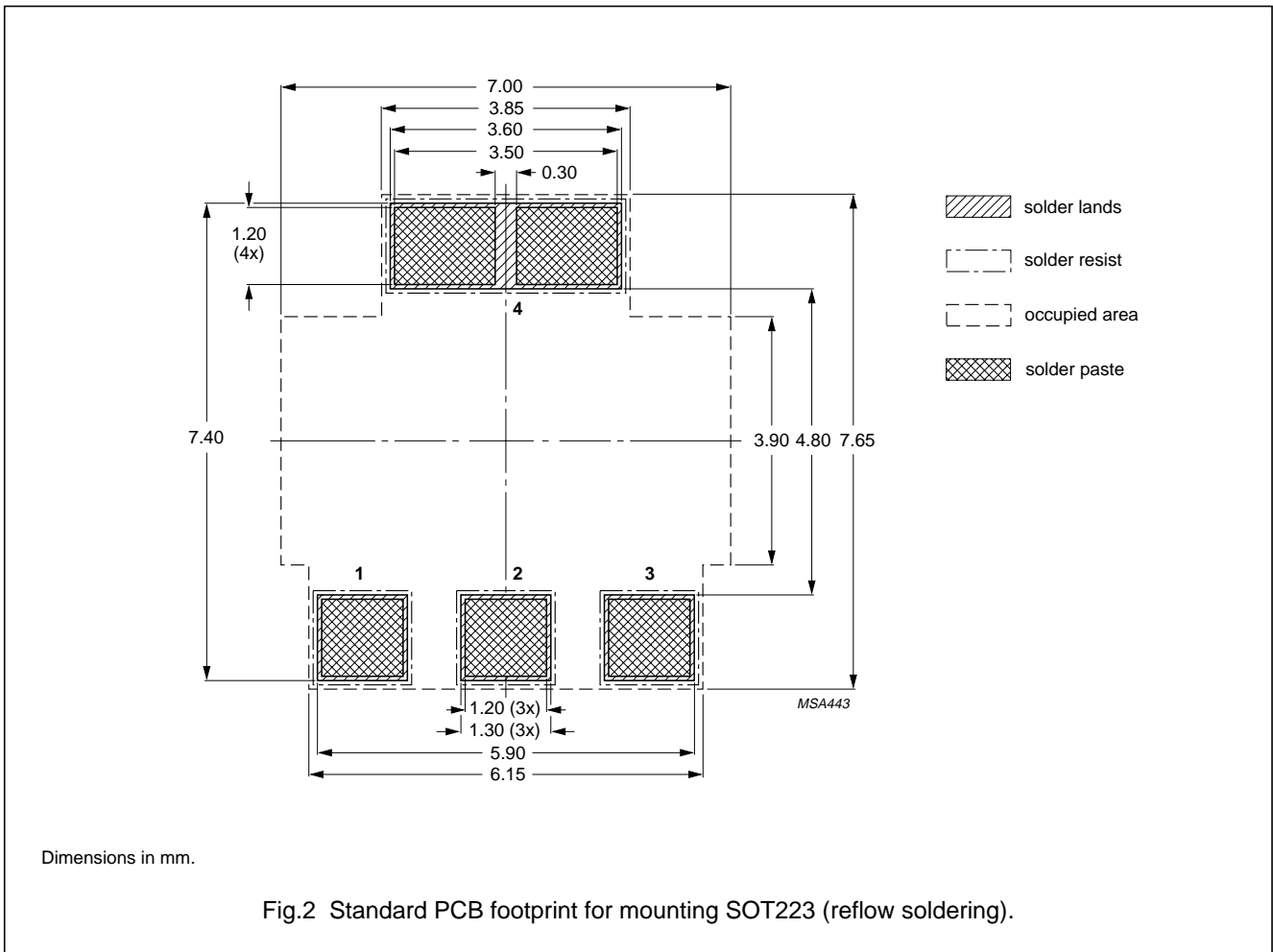
SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th(j-a)}$	thermal resistance from junction to ambient	$T_{amb} \leq 25$ °C; notes 1 and 2	200	K/W
		$T_{amb} \leq 25$ °C; notes 1 and 3	125	K/W
		$T_{amb} \leq 25$ °C; notes 1 and 4	89	K/W
$R_{th(j-s)}$	thermal resistance from junction to solder point	$T_{amb}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

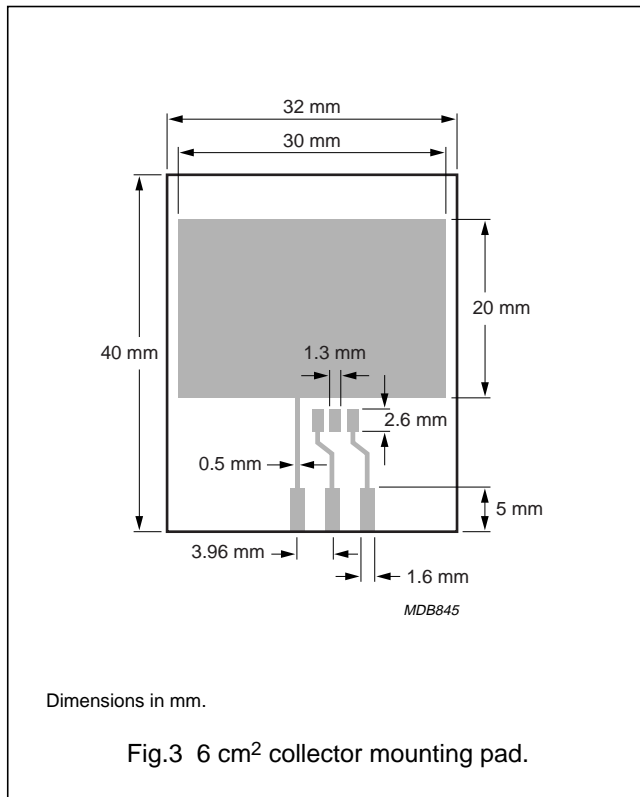
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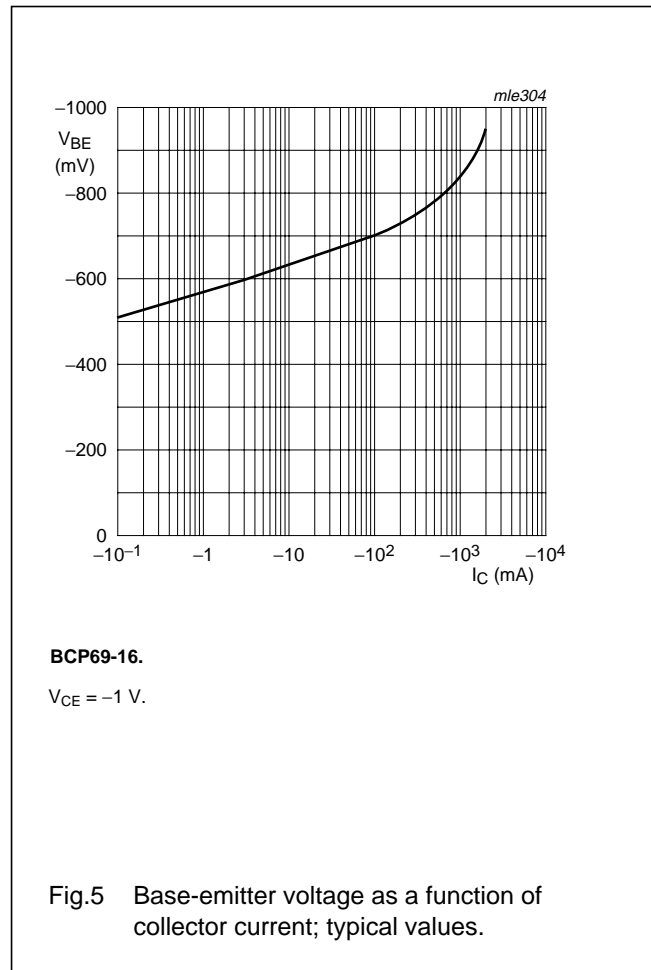
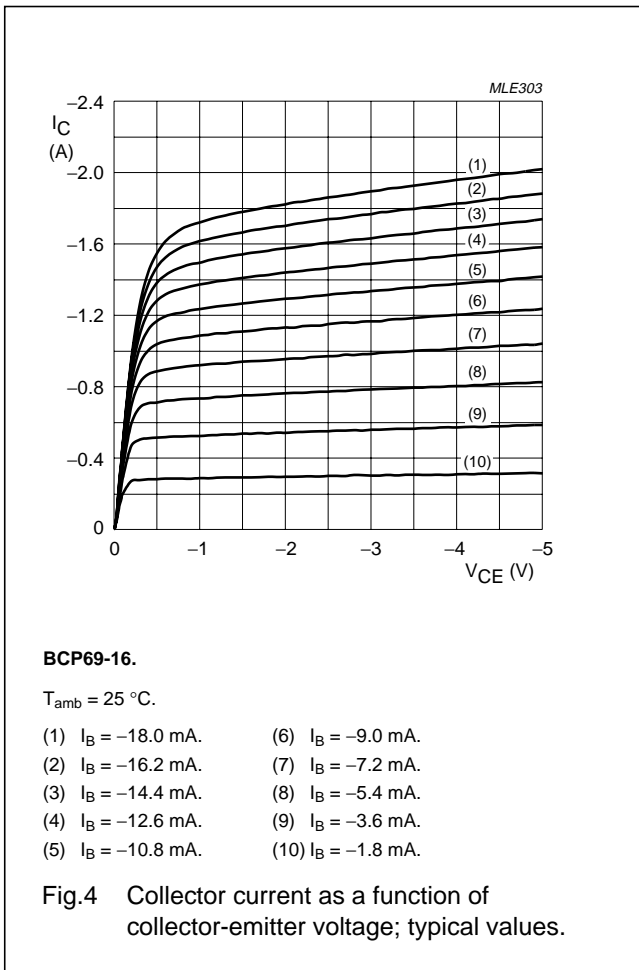
CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT	
I_{CBO}	collector-base cut-off current	$V_{CB} = -25\text{ V}; I_E = 0$	–	–	–100	nA	
		$V_{CB} = -25\text{ V}; I_E = 0; T_j = 150\text{ °C}$	–	–	–10	μA	
I_{EBO}	emitter-base cut-off current	$V_{EB} = -5\text{ V}; I_C = 0$	–	–	–100	nA	
h_{FE}	DC current gain	BCP69					
		$V_{CE} = -10\text{ V}; I_C = -5\text{ mA}$	50				
		$V_{CE} = -1\text{ V}; I_C = -500\text{ mA}$	85	–	375		
		$V_{CE} = -1\text{ V}; I_C = -1\text{ A}$	60	–	–		
		BCP69-16					
		$V_{CE} = -1\text{ V}; I_C = -500\text{ mA}$	100	–	250		
V_{CEsat}	collector-emitter saturation voltage	$I_C = -1\text{ A}; I_B = -100\text{ mA}$	–	–	–500	mV	
		$V_{CE} = -10\text{ V}; I_C = -5\text{ mA}$	–	–	–700	mV	
V_{BE}	base-emitter voltage	$V_{CE} = -10\text{ V}; I_C = -5\text{ mA}$	–	–	–700	mV	
		$V_{CE} = -1\text{ V}; I_C = -1\text{ A}$	–	–	–1	V	
C_c	collector capacitance	$V_{CB} = -10\text{ V}; I_E = I_C = 0; f = 1\text{ MHz}$	–	28	–	pF	
f_T	transition frequency	$V_{CE} = -5\text{ V}; I_C = -50\text{ mA}; f = 100\text{ MHz}$	40	140	–	MHz	

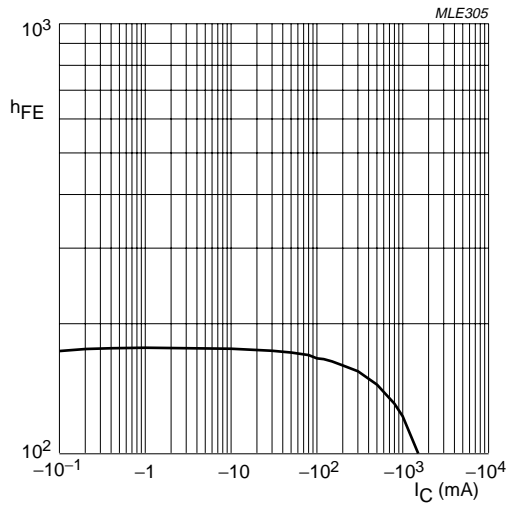
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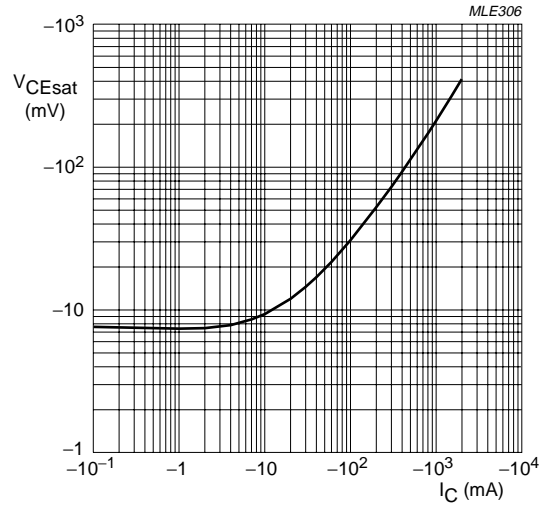
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BCP69-16.

$V_{CE} = -1$ V.

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



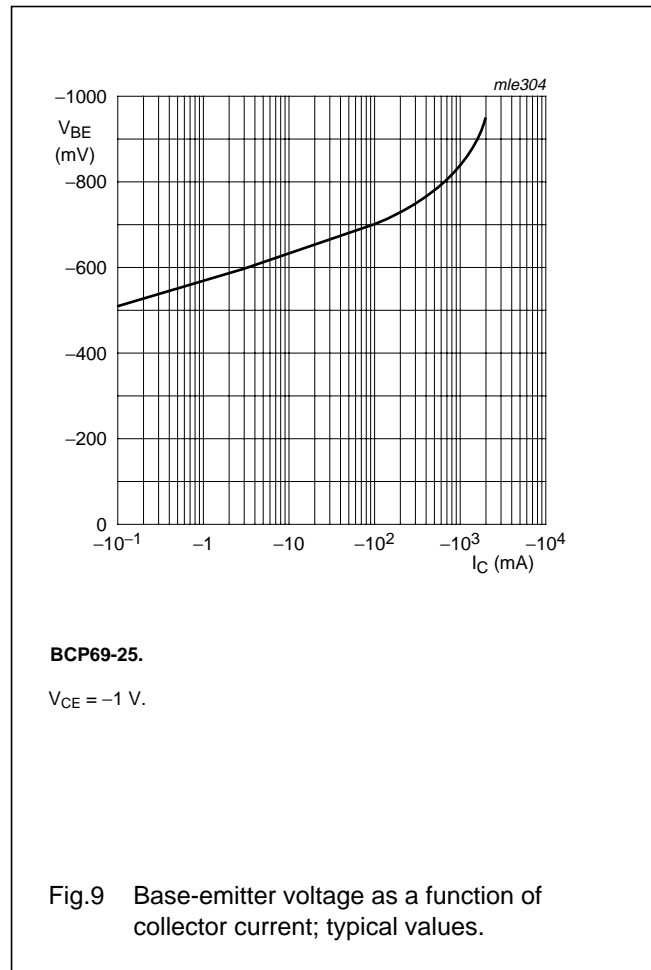
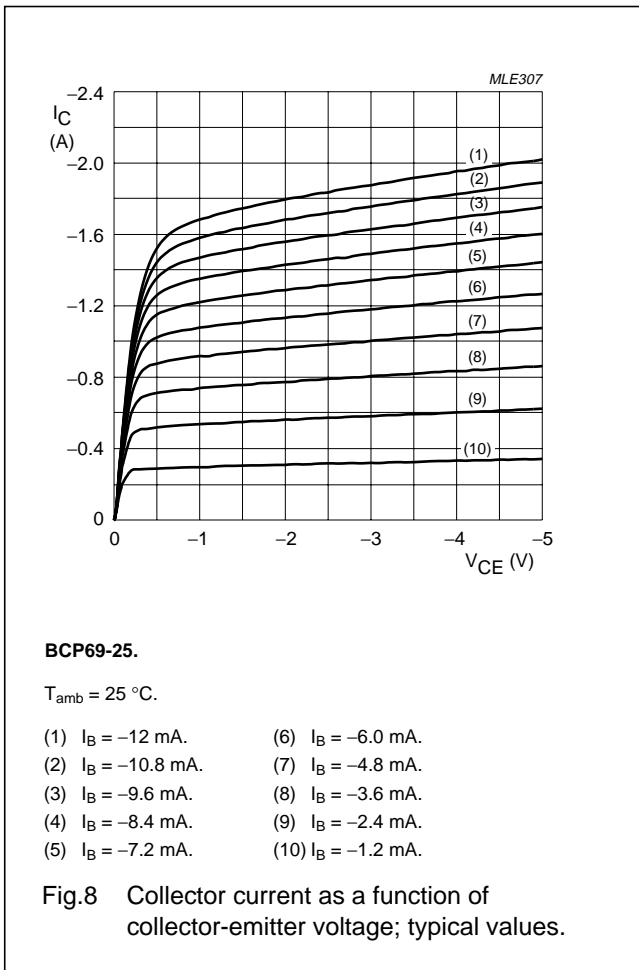
BCP69-16.

$I_C/I_B = 10$.

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

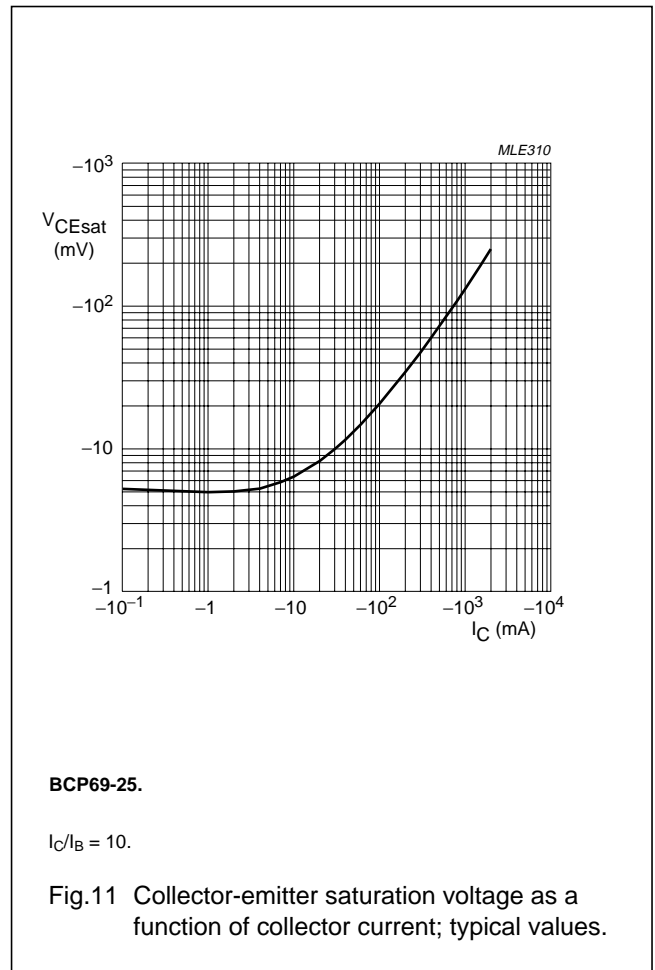
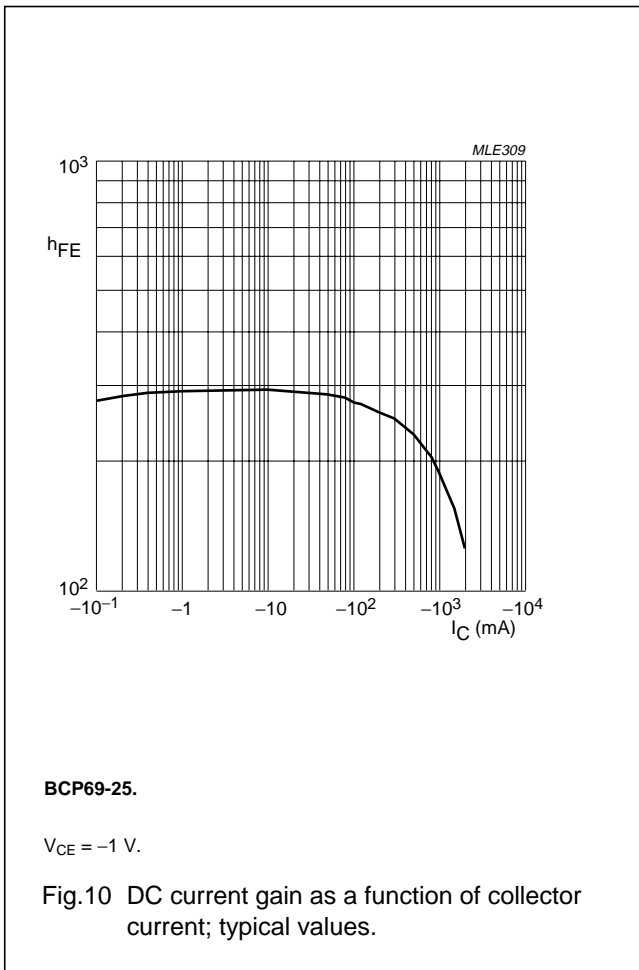
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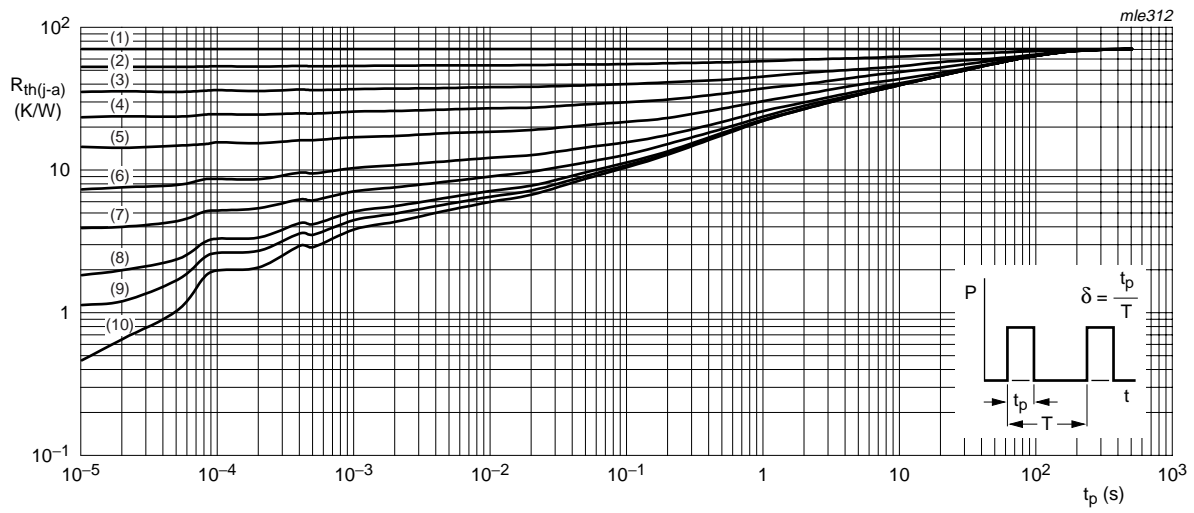
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PNP medium power transistor;
20 V, 1 A

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

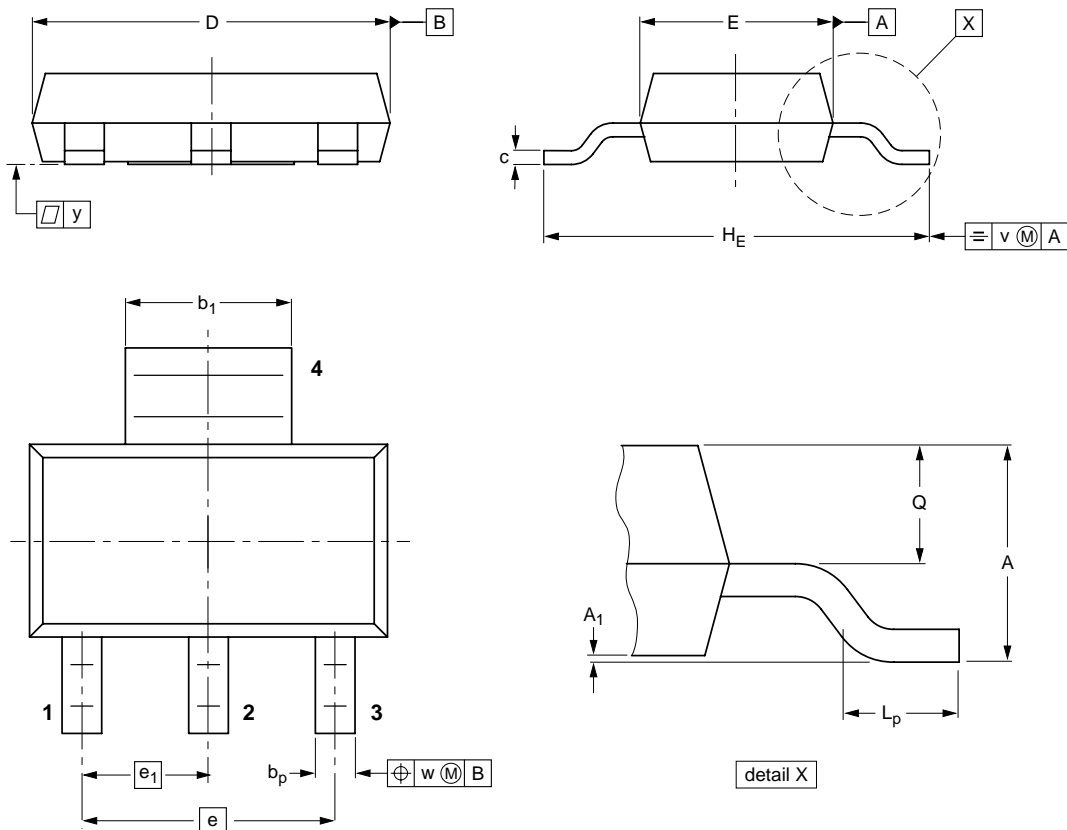
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PACKAGE OUTLINE

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 1.5	0.10 0.01	0.80 0.60	3.1 2.9	0.32 0.22	6.7 6.3	3.7 3.3	4.6	2.3	7.3 6.7	1.1 0.7	0.95 0.85	0.2	0.1	0.1

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

PNP medium power transistor; 20 V, 1 A

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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.
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