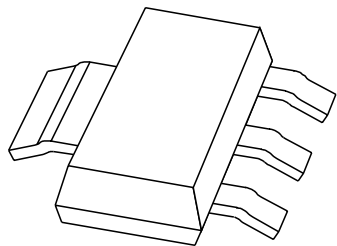


# DATA SHEET



## **BCP68** NPN medium power transistor

Product specification  
Supersedes data of September 1994  
File under Discrete Semiconductors, SC04

1997 Apr 09

## NPN medium power transistor

BCP68

## FEATURES

- High current (max. 1 A)
- Low voltage (max. 20 V).

## APPLICATIONS

- General purpose switching and amplification under high current conditions.

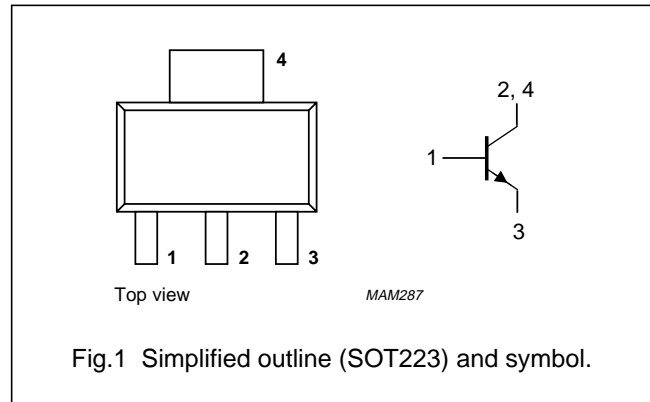
## DESCRIPTION

NPN medium power transistor in a SOT223 plastic package.

PNP complement: BCP69.

## PINNING

PIN	DESCRIPTION
1	base
2, 4	collector
3	emitter



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$V_{CBO}$	collector-base voltage	open emitter	–	32	V
$V_{CEO}$	collector-emitter voltage	open base	–	20	V
$I_{CM}$	peak collector current		–	2	A
$P_{tot}$	total power dissipation	$T_{amb} \leq 25\text{ }^{\circ}\text{C}$	–	1.37	W
$h_{FE}$	DC current gain	$I_C = 500\text{ mA}; V_{CE} = 1\text{ V}$	85	375	
$f_T$	transition frequency	$I_C = 10\text{ mA}; V_{CE} = 5\text{ V}; f = 100\text{ MHz}$	40	–	MHz

## NPN medium power transistor

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**LIMITING VALUES**

In accordance with the Absolute Maximum Rating System (IEC 134).

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	$T_{amb} \leq 25\text{ °C}$ ; note 1	–	1.37	W
$T_{stg}$	storage temperature		–65	+150	°C
$T_j$	junction temperature		–	150	°C
$T_{amb}$	operating ambient temperature		–65	+150	°C

**Note**

1. Device mounted on a printed-circuit board, single-sided copper, tinplated, mounting pad for collector 1 cm<sup>2</sup>.  
For other mounting conditions, see *“Thermal considerations for SOT223 in the General part of handbook SC04”*.

**THERMAL CHARACTERISTICS**

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-a}$	thermal resistance from junction to ambient	note 1	91	K/W
$R_{th\ j-s}$	thermal resistance from junction to soldering point		10	K/W

**Note**

1. Device mounted on a printed-circuit board, single-sided copper, tinplated, mounting pad for collector 1 cm<sup>2</sup>.  
For other mounting conditions, see *“Thermal considerations for SOT223 in the General part of handbook SC04”*.

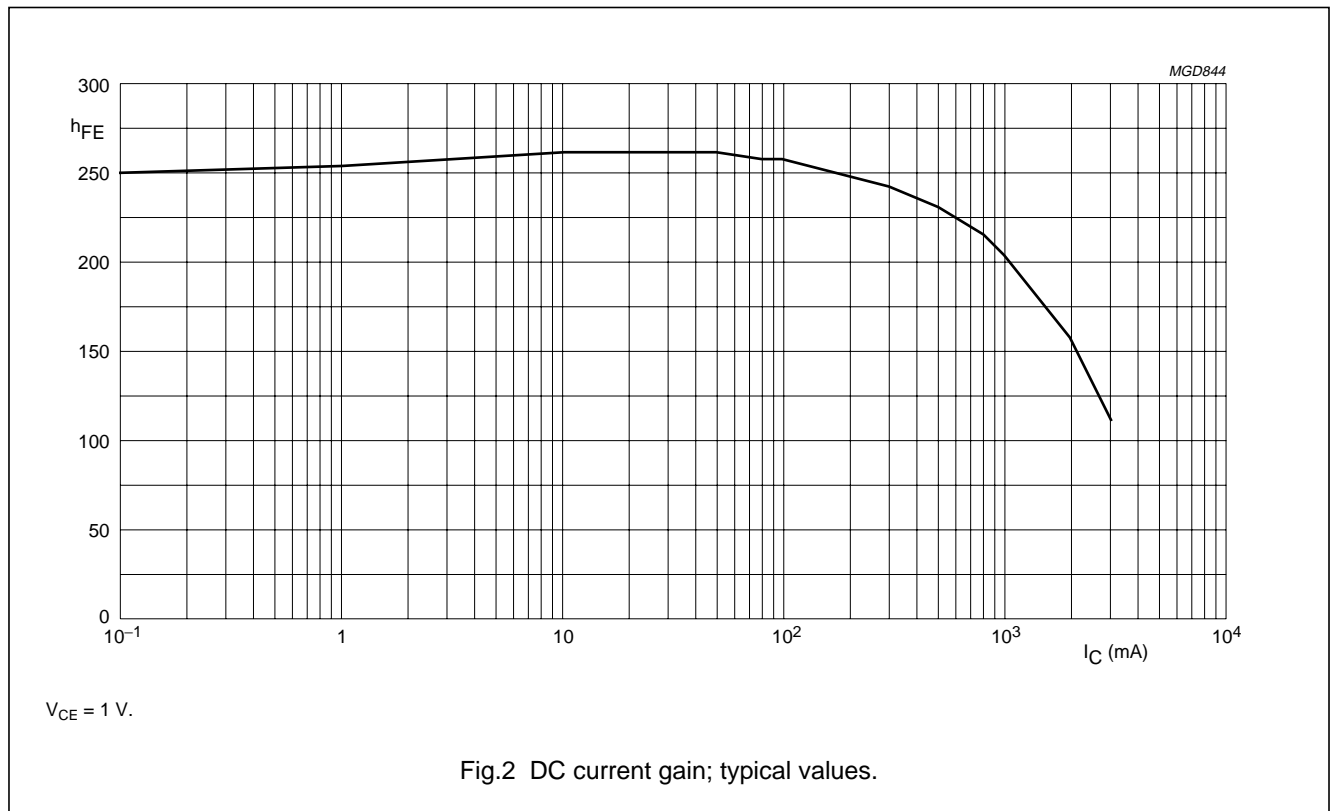
NPN medium power transistor

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**CHARACTERISTICS**

$T_j = 25\text{ }^\circ\text{C}$  unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$I_{CBO}$	collector cut-off current	$I_E = 0; V_{CB} = 25\text{ V}$	–	–	100	nA
		$I_E = 0; V_{CB} = 25\text{ V}; T_j = 150\text{ }^\circ\text{C}$	–	–	10	$\mu\text{A}$
$I_{EBO}$	emitter cut-off current	$I_C = 0; V_{EB} = 5\text{ V}$	–	–	100	nA
$h_{FE}$	DC current gain	$I_C = 5\text{ mA}; V_{CE} = 10\text{ V}$	50	–	–	
		$I_C = 500\text{ mA}; V_{CE} = 1\text{ V}; \text{ see Fig.2}$	85	–	375	
		$I_C = 1\text{ A}; V_{CE} = 1\text{ V}; \text{ see Fig.2}$	60	–	–	
$h_{FE}$	DC current gain BCP68-10 BCP68-16 BCP68-25	$I_C = 500\text{ mA}; V_{CE} = 1\text{ V}; \text{ see Fig.2}$	–	–	160	
			100	–	250	
			160	–	–	
$V_{CEsat}$	collector-emitter saturation voltage	$I_C = 1\text{ A}; I_B = 100\text{ mA}$	–	–	500	mV
$V_{BE}$	base-emitter voltage	$I_C = 5\text{ mA}; V_{CE} = 10\text{ V}$	–	620	–	mV
		$I_C = 1\text{ A}; V_{CE} = 1\text{ V}$	–	–	1	V
$C_c$	collector capacitance	$I_E = i_e = 0; V_{CB} = 5\text{ V}; f = 1\text{ MHz}$	–	38	–	pF
$f_T$	transition frequency	$I_C = 10\text{ mA}; V_{CE} = 5\text{ V}; f = 100\text{ MHz}$	40	–	–	MHz
$\frac{h_{FE1}}{h_{FE2}}$	DC current gain ratio of the complementary pairs	$ I_C  = 0.5\text{ A};  V_{CE}  = 1\text{ V}$	–	–	1.6	



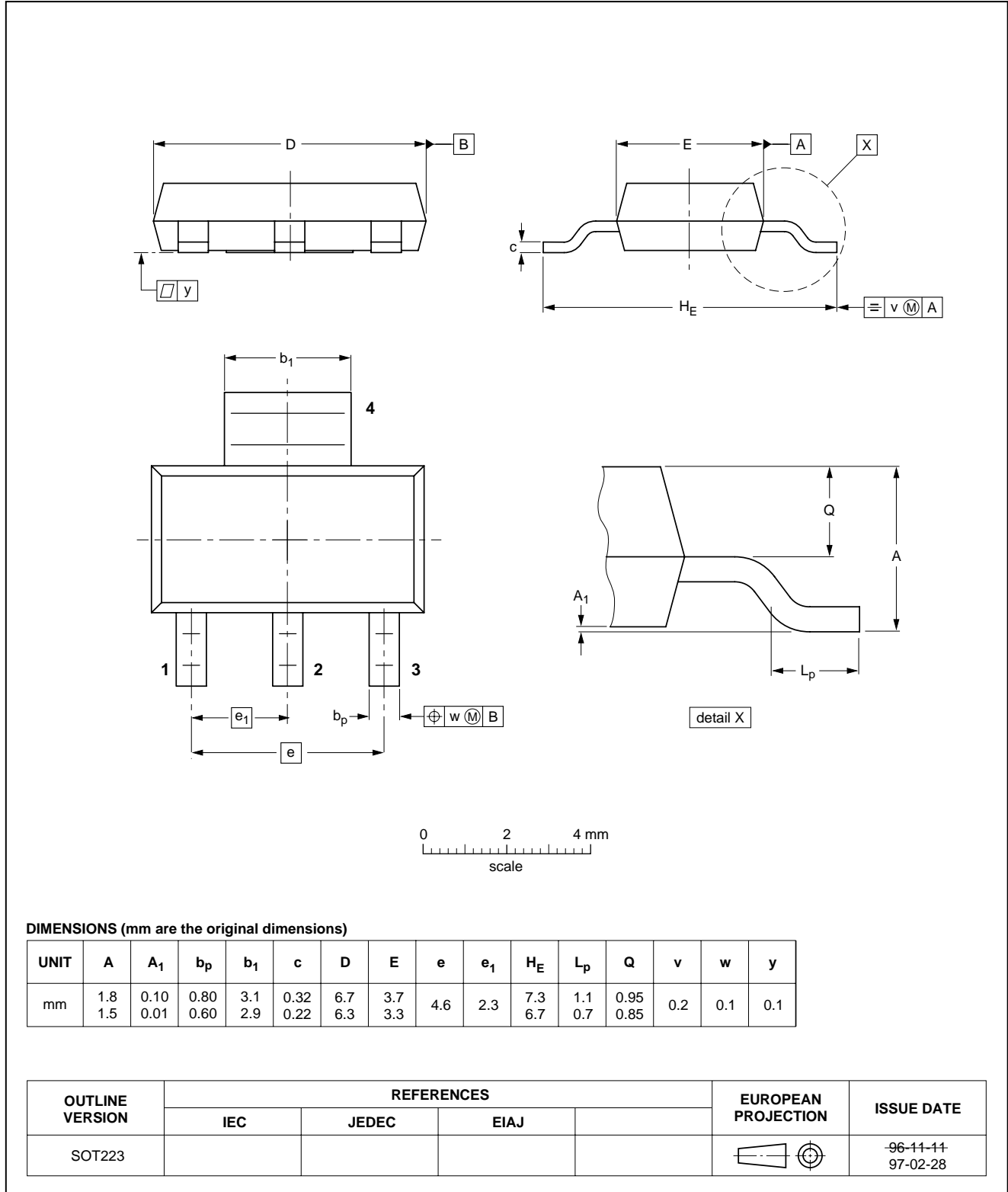
# NPN medium power transistor

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## PACKAGE OUTLINE

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

SOT223



## NPN medium power transistor

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**DEFINITIONS**

<b>Data Sheet Status</b>	
Objective specification	This data sheet contains target or goal specifications for product development.
Preliminary specification	This data sheet contains preliminary data; supplementary data may be published later.
Product specification	This data sheet contains final product specifications.
<b>Limiting values</b>	
Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). 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.	
<b>Application information</b>	
Where application information is given, it is advisory and does not form part of the specification.	

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NPN medium power transistor

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