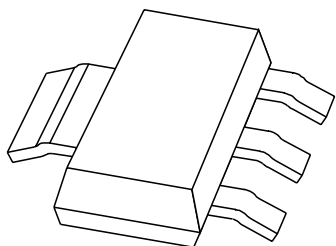


DATA SHEET



BSP19; BSP20 NPN high-voltage transistors

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

1997 Mar 03

NPN high-voltage transistors

BSP19; BSP20

FEATURES

- Low current (max. 50 mA)
- High voltage (max. 350 V).

APPLICATIONS

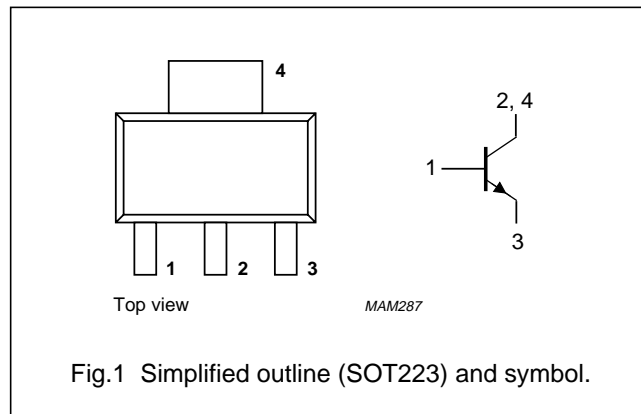
- Switching and amplification
- Especially used in telephony and automotive applications.

DESCRIPTION

NPN transistor in a SOT223 plastic package.
PNP complements: BSP15 and BSP16.

PINNING

PIN	DESCRIPTION
1	base
2, 4	collector
3	emitter



QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{CB0}	collector-base voltage	open emitter			
	BSP19		–	400	V
	BSP20		–	300	V
V_{CEO}	collector-emitter voltage	open base			
	BSP19		–	350	V
	BSP20		–	250	V
I_C	collector current (DC)		–	50	mA
P_{tot}	total power dissipation	$T_{amb} \leq 25\text{ }^\circ\text{C}$	–	1.2	W
h_{FE}	DC current gain	$V_{CE} = 10\text{ V}; I_C = 20\text{ mA}$	40	–	
f_T	transition frequency	$V_{CE} = 10\text{ V}; I_C = 10\text{ mA}; f = 100\text{ MHz}$	70	–	MHz

NPN high-voltage transistors

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LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V _{CB0}	collector-base voltage	open emitter	–	400	V
	BSP19			300	V
V _{CE0}	collector-emitter voltage	open base	–	350	V
	BSP19			250	V
V _{EBO}	emitter-base voltage	open collector	–	5	V
I _C	collector current (DC)		–	50	mA
I _B	base current (DC)		–	50	mA
P _{tot}	total power dissipation	T _{amb} ≤ 25 °C; note 1	–	1.2	W
T _{stg}	storage temperature		–65	+150	°C
T _j	junction temperature		–	150	°C
T _{amb}	operating ambient temperature		–65	+150	°C

Note

- Device mounted on printed-circuit board, single sided copper, tinplated, mounting pad for collector 1 cm².
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	104	K/W
R _{th j-s}	thermal resistance from junction to soldering point		23	K/W

Note

- Device mounted on printed-circuit board, single sided copper, tinplated, mounting pad for collector 1 cm².
For other mounting conditions, see "*Thermal considerations for SOT223 in the General part of handbook SC04*".

CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I _{CBO}	collector cut-off current	I _B = 0; V _{CE} = 300 V	–	20	nA
I _{EBO}	emitter cut-off current	I _C = 0; V _{EB} = 5 V	–	100	nA
h _{FE}	DC current gain	V _{CE} = 10 V; I _C = 20 mA	40	–	
V _{CEsat}	collector-emitter saturation voltage	I _C = 50 mA; I _B = 4 mA	–	0.5	V
C _c	collector capacitance	I _E = i _e = 0; V _{CB} = 10 V; f = 1 MHz	–	2.5	pF
f _T	transition frequency	V _{CE} = 10 V; I _C = 10 mA; f = 100 MHz	70	–	MHz

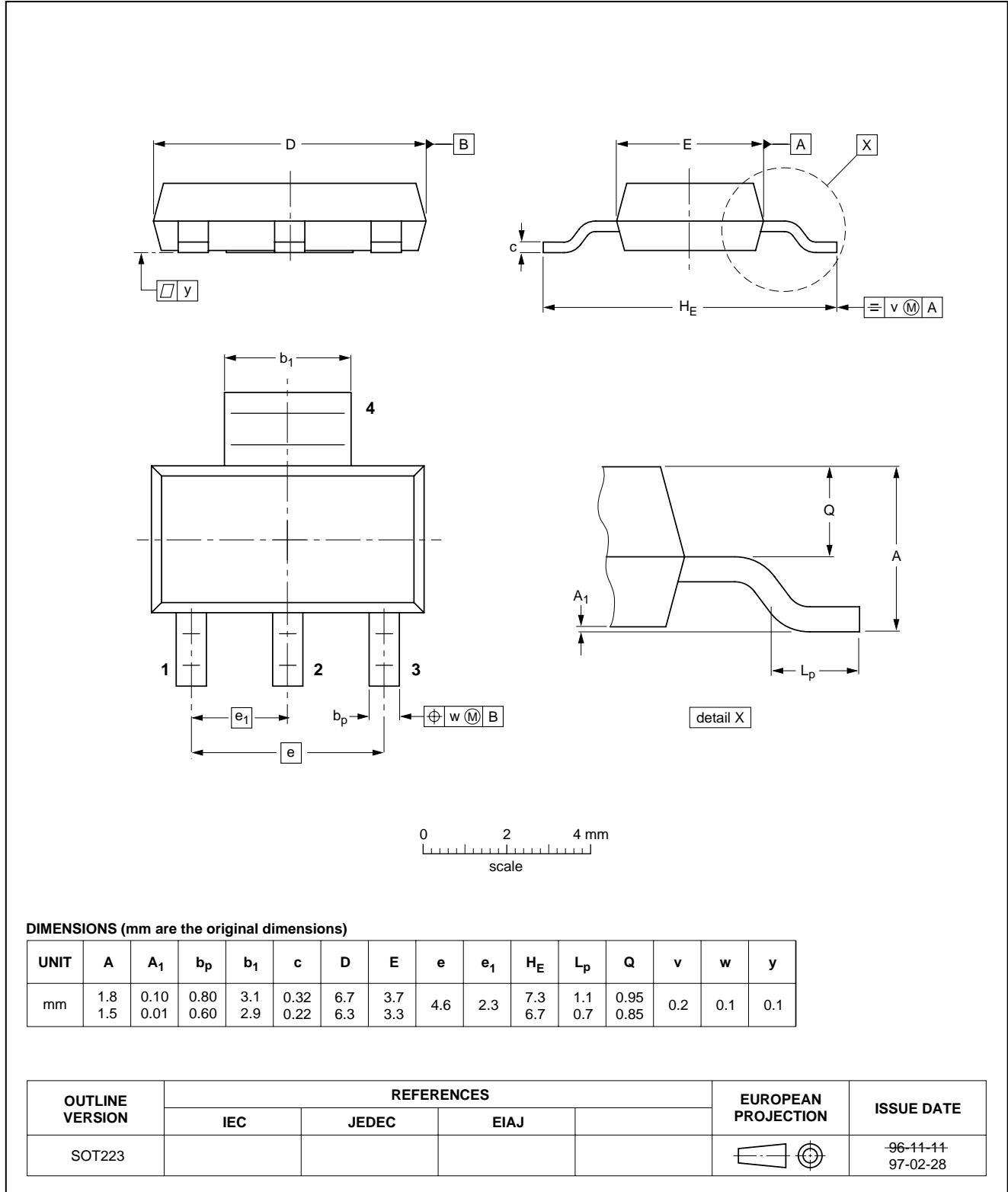
NPN high-voltage transistors

BSP19; BSP20

PACKAGE OUTLINE

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

SOT223



NPN high-voltage transistors

BSP19; BSP20

DEFINITIONS

Data sheet status	
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.
Limiting values	
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.	
Application information	
Where application information is given, it is advisory and does not form part of the specification.	

LIFE SUPPORT APPLICATIONS

These products are not designed for use in life support appliances, devices, or systems where malfunction of these products can reasonably be expected to result in personal injury. Philips customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Philips for any damages resulting from such improper use or sale.

NPN high-voltage transistors

BSP19; BSP20

NOTES

NPN high-voltage transistors

BSP19; BSP20

NOTES

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