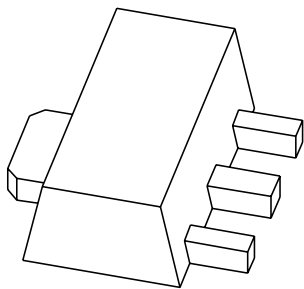


DATA SHEET



BSR30; BSR31; BSR33 PNP medium power transistors

Product specification
Supersedes data of 1997 Apr 01

1999 Apr 26

PNP medium power transistors

BSR30; BSR31; BSR33

FEATURES

- High current (max. 1 A)
- Low voltage (max. 80 V).

APPLICATIONS

- Telephony and general industrial applications
- Thick and thin-film circuits.

DESCRIPTION

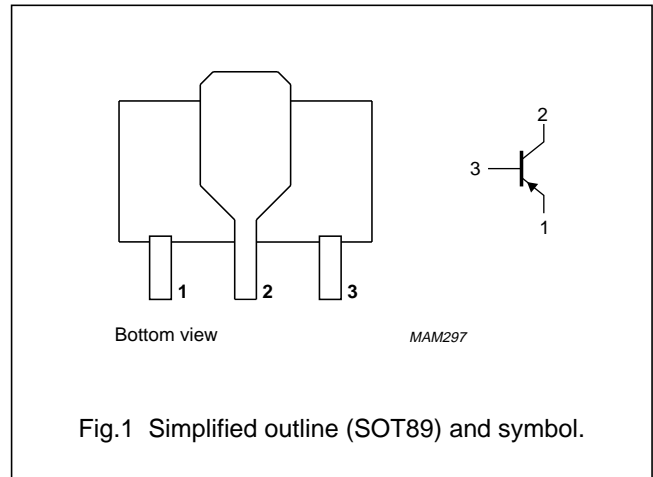
PNP medium power transistor in a SOT89 plastic package. NPN complements: BSR40; BSR41 and BSR43.

MARKING

TYPE NUMBER	MARKING CODE
BSR30	BR1
BSR31	BR2
BSR33	BR4

PINNING

PIN	DESCRIPTION
1	emitter
2	collector
3	base



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			
	BSR30; BSR31		–	–70	V
	BSR33		–	–90	V
V _{CEO}	collector-emitter voltage	open base			
	BSR30; BSR31		–	–60	V
	BSR33		–	–80	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} ≤ 25 °C; note 1	–	1.35	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 6 cm². For other mounting conditions, see “Thermal considerations for SOT89 in the General Part of associated Handbook”.

PNP medium power transistors

BSR30; BSR31; BSR33

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-a}$	thermal resistance from junction to ambient	note 1	93	K/W
$R_{th\ j-s}$	thermal resistance from junction to soldering point		13	K/W

Note

- Device mounted on a printed-circuit board, single-sided copper, tinplated, mounting pad for collector 6 cm².
For other mounting conditions, see "Thermal considerations for SOT89 in the General Part of associated Handbook".

CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_{CBO}	collector cut-off current	$I_E = 0; V_{CB} = -60\text{ V}$	–	–100	nA
		$I_E = 0; V_{CB} = -60\text{ V}; T_j = 150\text{ °C}$	–	–50	μA
I_{EBO}	emitter cut-off current	$I_C = 0; V_{EB} = -5\text{ V}$	–	–100	nA
h_{FE}	DC current gain BSR30 BSR31; BSR33	$I_C = -100\text{ μA}; V_{CE} = -5\text{ V}; \text{note 1}$	10	–	
			30	–	
	DC current gain BSR30 BSR31; BSR33	$I_C = -100\text{ mA}; V_{CE} = -5\text{ V}; \text{note 1}$	40	120	
			100	300	
	DC current gain BSR30 BSR31; BSR33	$I_C = -500\text{ mA}; V_{CE} = -5\text{ V}; \text{note 1}$	30	–	
			50	–	
V_{CEsat}	collector-emitter saturation voltage	$I_C = -150\text{ mA}; I_B = -15\text{ mA}; \text{note 1}$	–	–0.25	V
		$I_C = -500\text{ mA}; I_B = -50\text{ mA}; \text{note 1}$	–	–0.5	V
V_{BEsat}	base-emitter saturation voltage	$I_C = -150\text{ mA}; I_B = -15\text{ mA}; \text{note 1}$	–	–1	V
		$I_C = -500\text{ mA}; I_B = -50\text{ mA}; \text{note 1}$	–	–1.2	V
f_T	transition frequency	$I_C = -50\text{ mA}; V_{CE} = -10\text{ V};$ $f = 100\text{ MHz}$	100	–	MHz

Note

- Pulse test: $t_p = 300\text{ μs}; \delta < 0.01$.

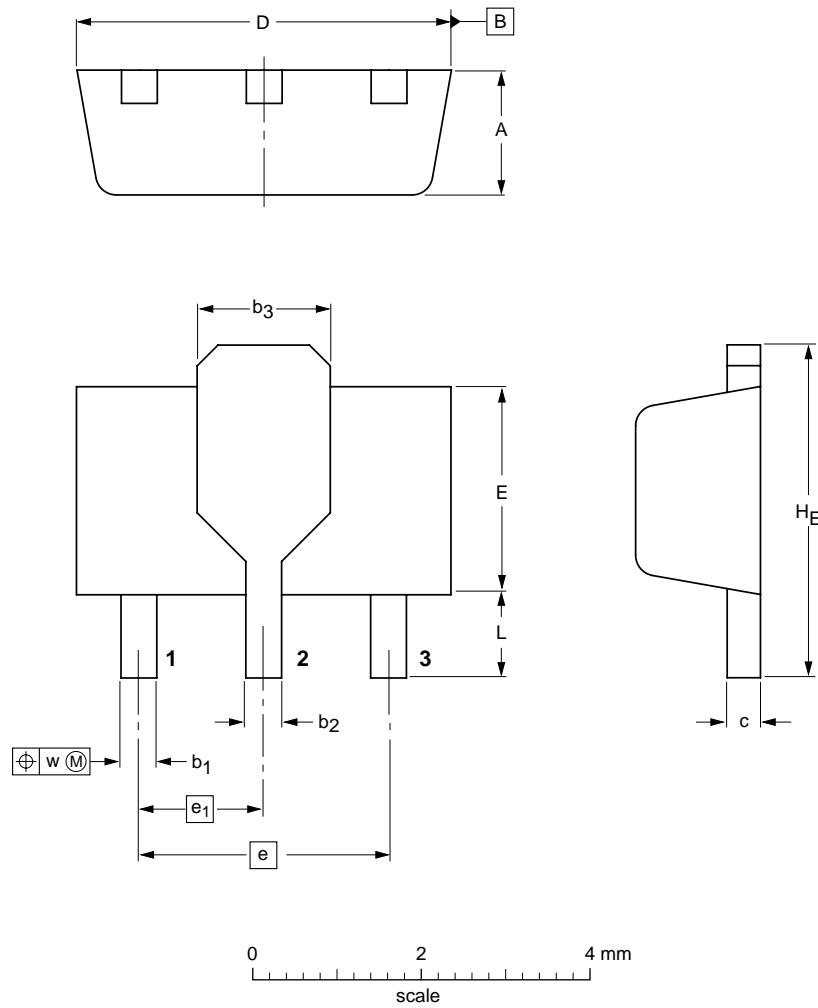
PNP medium power transistors

BSR30; BSR31; BSR33

PACKAGE OUTLINE

Plastic surface mounted package; collector pad for good heat transfer; 3 leads

SOT89



DIMENSIONS (mm are the original dimensions)

UNIT	A	b ₁	b ₂	b ₃	c	D	E	e	e ₁	H _E	L min.	w
mm	1.6 1.4	0.48 0.35	0.53 0.40	1.8 1.4	0.44 0.37	4.6 4.4	2.6 2.4	3.0	1.5	4.25 3.75	0.8	0.13

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT89						97-02-28

PNP medium power transistors

BSR30; BSR31; BSR33

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.

PNP medium power transistors

BSR30; BSR31; BSR33

NOTES

PNP medium power transistors

BSR30; BSR31; BSR33

NOTES

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