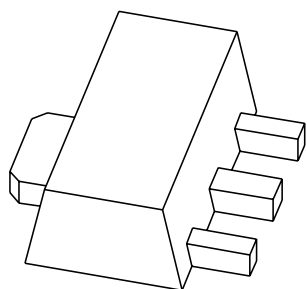


DATA SHEET



BSR30; BSR31; BSR32; BSR33 PNP medium power transistors

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

1997 Apr 01

PNP medium power transistors

BSR30; BSR31; BSR32; BSR33

FEATURES

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

APPLICATIONS

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

DESCRIPTION

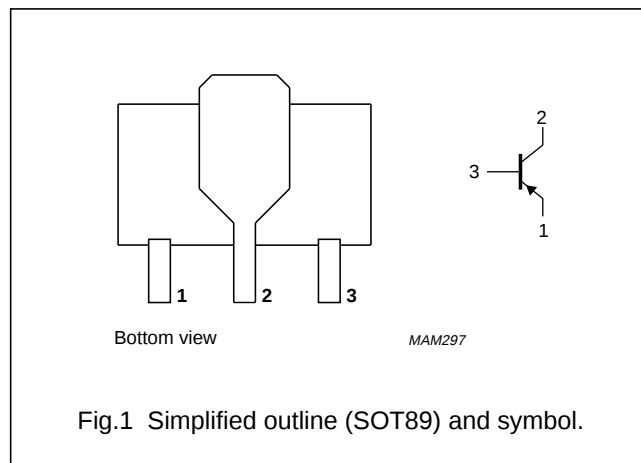
PNP medium power transistor in a SOT89 plastic package. NPN complements: BSR40; BSR41; BSR42 and BSR43.

MARKING

TYPE NUMBER	MARKING CODE	TYPE NUMBER	MARKING CODE
BRS30	BR1	BRS32	BR3
BRS31	BR2	BRS33	BR4

PINNING

PIN	DESCRIPTION
1	emitter
2	collector
3	base



QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{CBO}	collector-base voltage BSR30; BSR31 BSR32; BSR33	open emitter	—	–70	V
			—	–90	V
V_{CEO}	collector-emitter voltage BSR30; BSR31 BSR32; BSR33	open base	—	–60	V
			—	–80	V
I_{CM}	peak collector current		—	–2	A
P_{tot}	total power dissipation	$T_{amb} \leq 25\text{ }^{\circ}\text{C}$	—	1.4	W
h_{FE}	DC current gain BSR30; BSR32 BSR31; BSR33	$I_C = -100\text{ mA}; V_{CE} = -5\text{ V}$	40	120	
			100	300	
f_T	transition frequency	$I_C = -50\text{ mA}; V_{CE} = -10\text{ V}; f = 100\text{ MHz}$	100	—	MHz

PNP medium power transistors

BSR30; BSR31; BSR32; BSR33

LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V _{CBO}	collector-base voltage BSR30; BSR31 BSR32; BSR33	open emitter	–	–70	V
			–	–90	V
V _{CEO}	collector-emitter voltage BSR30; BSR31 BSR32; BSR33	open base	–	–60	V
			–	–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	–	1.4	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 cm².
For other mounting conditions, see “*Thermal considerations for the SOT89 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	89	K/W
R _{th j-s}	thermal resistance from junction to soldering point		8	K/W

Note

1. Device mounted on a printed-circuit board, single-sided copper, tinplated, mounting pad for collector 1 cm².
For other mounting conditions, see “*Thermal considerations for the SOT89 in the General part of handbook SC04*”.

PNP medium power transistors

BSR30; BSR31; BSR32; BSR33

CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_{CBO}	collector cut-off current	$I_{\text{E}} = 0; V_{\text{CB}} = -60\text{ V}$	–	–100	nA
		$I_{\text{E}} = 0; V_{\text{CB}} = -60\text{ V}; T_{\text{j}} = 150\text{ }^{\circ}\text{C}$	–	–50	μA
I_{EBO}	emitter cut-off current	$I_{\text{C}} = 0; V_{\text{EB}} = -5\text{ V}$	–	–100	nA
h_{FE}	DC current gain BSR30; BSR32	$I_{\text{C}} = -100\text{ }\mu\text{A}; V_{\text{CE}} = -5\text{ V}; \text{note 1}$	10	–	
	BSR31; BSR33		30	–	
h_{FE}	DC current gain BSR30; BSR32	$I_{\text{C}} = -100\text{ mA}; V_{\text{CE}} = -5\text{ V}; \text{note 1}$	40	120	
	BSR31; BSR33		100	300	
h_{FE}	DC current gain BSR30; BSR32	$I_{\text{C}} = -500\text{ mA}; V_{\text{CE}} = -5\text{ V}; \text{note 1}$	30	–	
	BSR31; BSR33		50	–	
V_{CEsat}	collector-emitter saturation voltage	$I_{\text{C}} = -150\text{ mA}; I_{\text{B}} = -15\text{ mA}; \text{note 1}$	–	–0.25	V
		$I_{\text{C}} = -500\text{ mA}; I_{\text{B}} = -50\text{ mA}; \text{note 1}$	–	–0.5	V
V_{BEsat}	base-emitter saturation voltage	$I_{\text{C}} = -150\text{ mA}; I_{\text{B}} = -15\text{ mA}; \text{note 1}$	–	–1	V
		$I_{\text{C}} = -500\text{ mA}; I_{\text{B}} = -50\text{ mA}; \text{note 1}$	–	–1.2	V
f_{T}	transition frequency	$I_{\text{C}} = -50\text{ mA}; V_{\text{CE}} = -10\text{ V}; f = 100\text{ MHz}$	100	–	MHz

Note

1. Pulse test: $t_{\text{p}} = 300\text{ }\mu\text{s}; \delta < 0.01$.

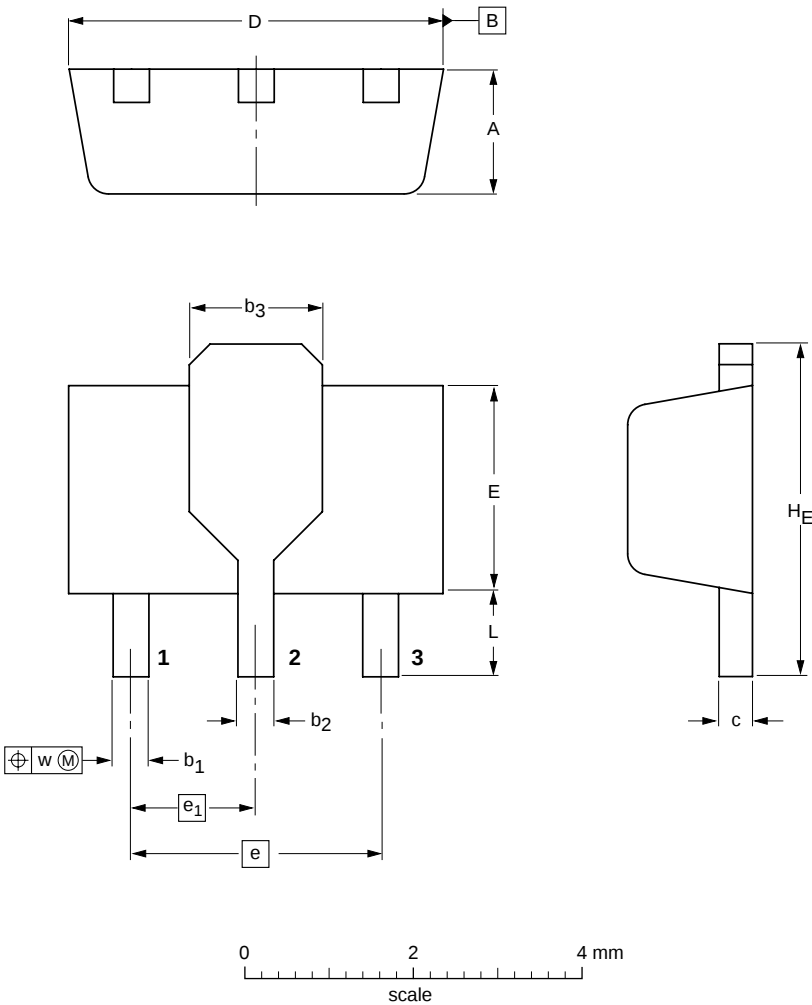
PNP medium power transistors

BSR30; BSR31; BSR32; 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 transistorsBSR30; BSR31; BSR32; 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

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PNP medium power transistors

BSR30; BSR31; BSR32; BSR33

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