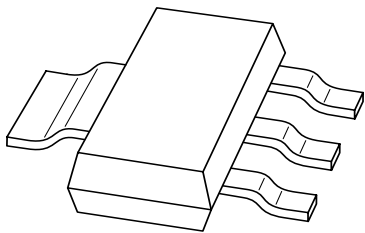


DATA SHEET



BSP31; BSP32; BSP33 PNP medium power transistors

Product data sheet
Supersedes data of 1997 Apr 08

1999 Apr 26

PNP medium power transistors

BSP31; BSP32; BSP33

FEATURES

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

APPLICATIONS

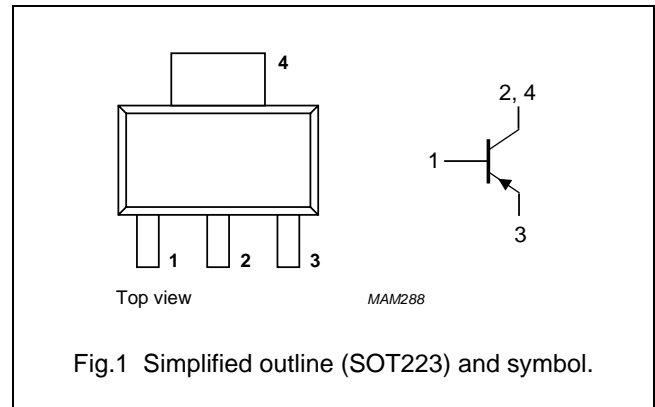
- Telephony and general industrial applications.

DESCRIPTION

PNP medium power transistor in a SOT223 plastic package. NPN complements: BSP41 and BSP43.

PINNING

PIN	DESCRIPTION
1	base
2, 4	collector
3	emitter



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			
	BSP31		–	–70	V
	BSP32; BSP33		–	–90	V
V _{CEO}	collector-emitter voltage	open base			
	BSP31		–	–60	V
	BSP32; BSP33		–	–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	–	1.3	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 SOT223 in the General Part of associated Handbook”.

PNP medium power transistors

BSP31; BSP32; BSP33

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		12	K/W

Note

- 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 SOT223 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 BSP32	$I_C = -100\text{ }\mu\text{A}; V_{CE} = -5\text{ V}; \text{note 1}$	10	–	
		$I_C = -100\text{ mA}; V_{CE} = -5\text{ V}; \text{note 1}$	40	120	
		$I_C = -500\text{ mA}; V_{CE} = -5\text{ V}; \text{note 1}$	30	–	
	DC current gain BSP31; BSP33	$I_C = -100\text{ }\mu\text{A}; V_{CE} = -5\text{ V}; \text{note 1}$	30	–	
		$I_C = -100\text{ mA}; V_{CE} = -5\text{ V}; \text{note 1}$	100	300	
		$I_C = -500\text{ mA}; V_{CE} = -5\text{ V}; \text{note 1}$	50	–	
V_{CEsat}	collector-emitter saturation voltage	$I_C = -150\text{ mA}; I_B = -15\text{ mA}; \text{note 1}$	–	–250	mV
		$I_C = -500\text{ mA}; I_B = -50\text{ mA}; \text{note 1}$	–	–500	mV
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
C_c	collector capacitance	$I_E = i_e = 0; V_{CB} = -10\text{ V}; f = 1\text{ MHz}$	–	20	pF
C_e	emitter capacitance	$I_C = i_c = 0; V_{EB} = -0.5\text{ V}; f = 1\text{ MHz}$	–	120	pF
f_T	transition frequency	$I_C = -50\text{ mA}; V_{CE} = -10\text{ V}; f = 100\text{ MHz}$	100	–	MHz
Switching times (between 10% and 90% levels)					
t_{on}	turn-on time	$I_{Con} = -100\text{ mA}; I_{Bon} = -5\text{ mA}; I_{Boff} = 5\text{ mA}$	–	500	ns
t_{off}	turn-off time		–	650	ns

Note

- Pulse test: $t_p \leq 300\text{ }\mu\text{s}$; $\delta \leq 0.01$.

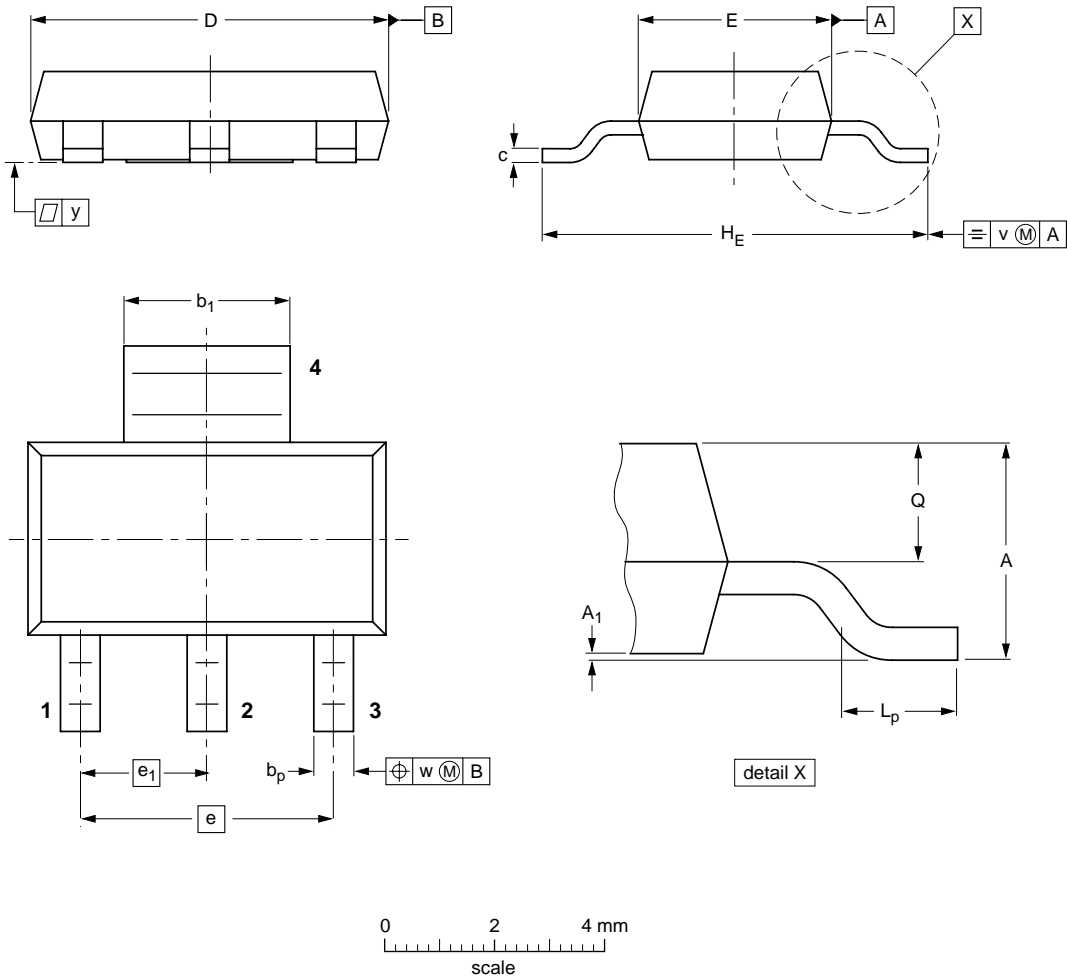
PNP medium power transistors

BSP31; BSP32; BSP33

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