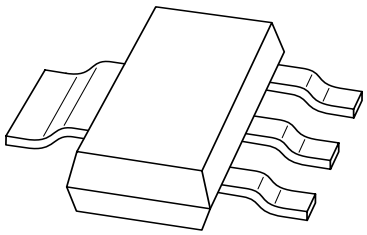
DATA SHEET



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

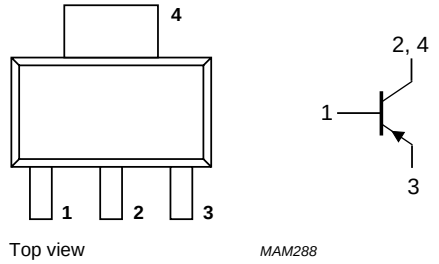


Fig.1 Simplified outline (SOT223) and symbol.

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 cm^2. For other mounting conditions, see *"Thermal considerations for SOT223 in the General Part of associated Handbook".*

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	93	K/W
$R_{th\ j\text{-}s}$	thermal resistance from junction to soldering point		12	K/W

Note

1. Device mounted on a printed-circuit board, single sided copper, tinplated, mounting pad for collector 1 cm^2. For other mounting conditions, see *"Thermal considerations for SOT223 in the General Part of associated Handbook".*

CHARACTERISTICS

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

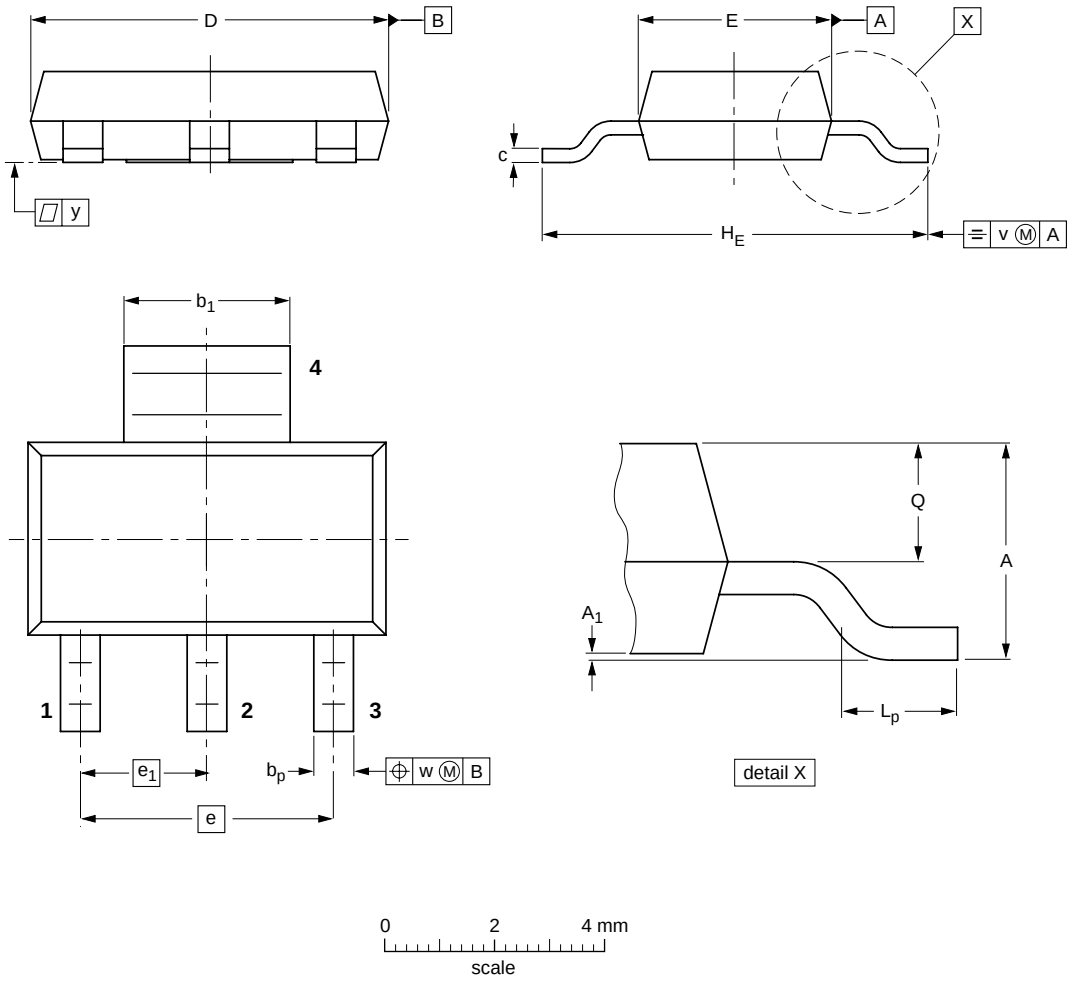
SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_{CBO}	collector cut-off current	I_E = 0; V_{CB} = –60 V	–	–100	nA
		I_E = 0; V_{CB} = –60 V; T_j = 150 °C	–	–50	μA
I_{EBO}	emitter cut-off current	I_C = 0; V_{EB} = –5 V	–	–100	nA
h_{FE}	DC current gain				
	BSP32	I_C = –100 μA; V_{CE} = –5 V; note 1	10	–	
		I_C = –100 mA; V_{CE} = –5 V; note 1	40	120	
		I_C = –500 mA; V_{CE} = –5 V; note 1	30	–	
	DC current gain				
	BSP31; BSP33	I_C = –100 μA; V_{CE} = –5 V; note 1	30	–	
		I_C = –100 mA; V_{CE} = –5 V; note 1	100	300	
		I_C = –500 mA; V_{CE} = –5 V; note 1	50	–	
V_{CEsat}	collector-emitter saturation voltage	I_C = –150 mA; I_B = –15 mA; note 1	–	–250	mV
		I_C = –500 mA; I_B = –50 mA; note 1	–	–500	mV
V_{BEsat}	base-emitter saturation voltage	IC = –150 mA; IB = –15 mA; note 1	–	–1	V
		I_C = –500 mA; I_B = –50 mA; note 1	–	–1.2	V
C_c	collector capacitance	I_E = i_e = 0; V_{CB} = –10 V; f = 1 MHz	–	20	pF
C_e	emitter capacitance	I_C = i_c = 0; V_{EB} = –0.5 V; f = 1 MHz	–	120	pF
f_T	transition frequency	I_C = –50 mA; V_{CE} = –10 V; f = 100 MHz	100	–	MHz
Switching times (between 10% and 90% levels)					
t_{on}	turn-on time	I_{Con} = –100 mA; I_{Bon} = –5 mA; I_{Boff} = 5 mA	–	500	ns
t_{off}	turn-off time		–	650	ns

Note

1. Pulse test: $t_p \leq 300$ μs; $\delta \leq 0.01$.

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

DATA SHEET STATUS

DOCUMENT STATUS[1]	PRODUCT STATUS[2]	DEFINITION
Objective data sheet	Development	This document contains data from the objective specification for product development.
Preliminary data sheet	Qualification	This document contains data from the preliminary specification.
Product data sheet	Production	This document contains the product specification.

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NXP Semiconductors

Customer notification

This data sheet was changed to reflect the new company name NXP Semiconductors, including new legal definitions and disclaimers. No changes were made to the technical content, except for package outline drawings which were updated to the latest version.

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