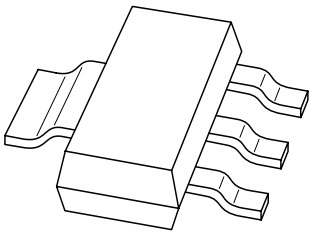
DATA SHEET



PBSS5350Z
50 V low V_{CEsat} PNP transistor

Product data sheet
Supersedes data of 2003 Jan 20

2003 May 13

50 V low V_{CEsat} PNP transistor PBSS5350Z

FEATURES

- Low collector-emitter saturation voltage
- High collector current capability: I_C and I_{CM}
- High collector current gain (h_{FE}) at high I_C
- Higher efficiency leading to less heat generation
- Reduced PCB area requirements compared to DPAK.

APPLICATIONS

- Power management
  - DC/DC converters
  - Supply line switching
  - Battery charger
  - Linear voltage regulation (LDO).
- Peripheral drivers
  - Driver in low supply voltage applications, e.g. lamps, LEDs
  - Inductive load driver, e.g. relays, buzzers, motors.

DESCRIPTION

PNP low V_{CEsat} transistor in a SOT223 plastic package.
NPN complement: PBSS4350Z.

MARKING

TYPE NUMBER	MARKING CODE
PBSS5350Z	PB5350

QUICK REFERENCE DATA

SYMBOL	PARAMETER	MAX.	UNIT
V_{CEO}	collector-emitter voltage	–50	V
I_C	collector current (DC)	–3	A
I_{CM}	peak collector current	–5	A
R_{CEsat}	equivalent on-resistance	<150	mΩ

PINNING

PIN	DESCRIPTION
1	base
2	collector
3	emitter
4	collector

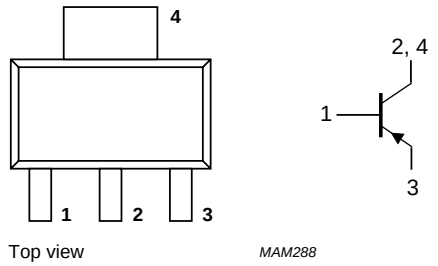


Fig.1 Simplified outline (SOT223) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 60134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{CBO}	collector-base voltage	open emitter	–	−60	V
V_{CEO}	collector-emitter voltage	open base	–	−50	V
V_{EBO}	emitter-base voltage	open collector	–	−6	V
I_C	collector current (DC)		–	−3	A
I_{CM}	peak collector current		–	−5	A
I_{BM}	peak base current		–	−1	A
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C; notes 1 and 3	–	1.35	W
		$T_{amb} \leq 25$ °C; notes 2 and 3	–	2	W
T_{stg}	storage temperature		−65	+150	°C
T_j	junction temperature		–	150	°C
T_{amb}	operating ambient temperature		−65	+150	°C

Notes

1. Device mounted on a printed-circuit board; single sided copper; tinplated; mounting pad for collector 1 cm^2.
2. Device mounted on a printed-circuit board; single sided copper; tinplated; mounting pad for collector 6 cm^2.
3. 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	in free air; notes 1 and 3	92	K/W
		in free air; notes 2 and 3	62.5	K/W

Notes

1. Device mounted on a printed-circuit board; single sided copper; tinplated; mounting pad for collector 1 cm.
2. Device mounted on a printed-circuit board; single sided copper; tinplated; mounting pad for collector 6 cm^2.
3. For other mounting conditions see *"Thermal considerations for SOT223 in the General Part of associated Handbook"*.

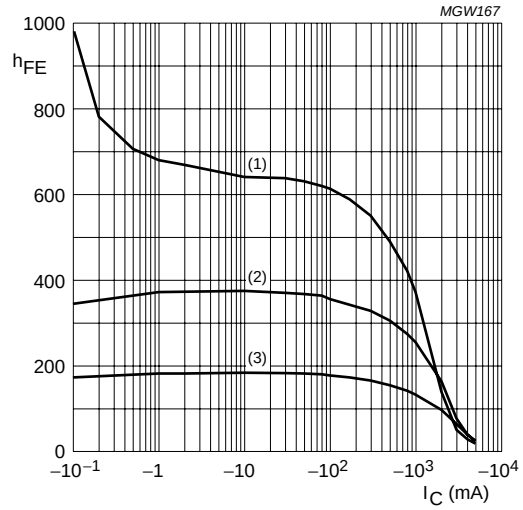
CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_{CBO}	collector-base cut-off current	V_{CB} = –50 V; I_E = 0	–	–	–100	nA
		V_{CB} = –50 V; I_E = 0; T_j = 150 °C	–	–	–50	μA
I_{EBO}	emitter-base cut-off current	V_{EB} = –5 V; I_C = 0	–	–	–100	nA
h_{FE}	DC current gain	V_{CE} = –2 V;				
		I_C = –500 mA	200	–	–	
		I_C = –1 A; note 1	200	–	–	
		I_C = –2 A; note 1	100	–	–	
V_{CEsat}	collector-emitter saturation voltage	I_C = –500 mA; I_B = –50 mA	–	–	–100	mV
		I_C = –1 A; I_B = –50 mA	–	–	–180	mV
		I_C = –2 A; I_B = –200 mA; note 1	–	–	–300	mV
R_{CEsat}	equivalent on-resistance	I_C = –2 A; I_B = –200 mA; note 1	–	120	<150	mΩ
V_{BEsat}	base-emitter saturation voltage	I_C = –2 A; I_B = –200 mA; note 1	–	–	–1.2	V
V_{BEon}	base-emitter turn-on voltage	V_{CE} = –2 V; I_C = –1 A; note 1	–	–	–1.1	V
f_T	transition frequency	I_C = –100 mA; V_{CE} = –5 V; f = 100 MHz	100	–	–	MHz
C_c	collector capacitance	V_{CB} = –10 V; I_E = I_e = 0; f = 1 MHz	–	–	40	pF

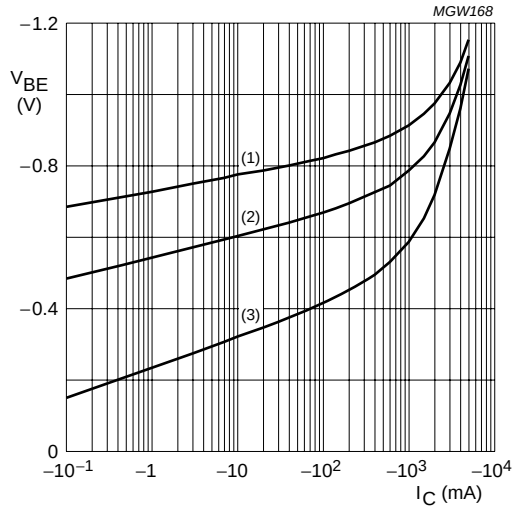
Note

1. Pulse test: $t_p \leq 300$ μs; $\delta \leq 0.02$.



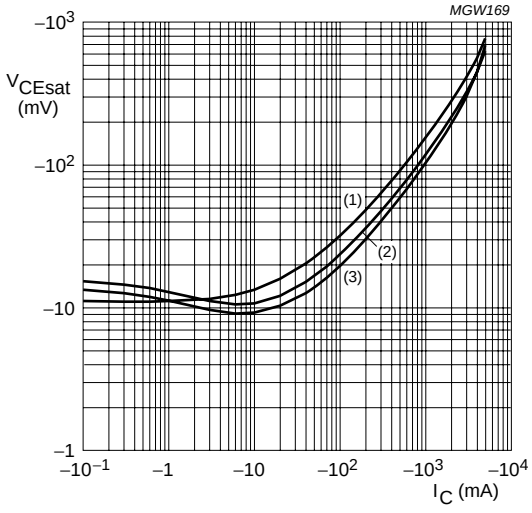
V_{CE} = −2 V.
(1) T_{amb} = 150 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = −55 °C.

Fig.2 DC current gain as a function of collector current; typical values.



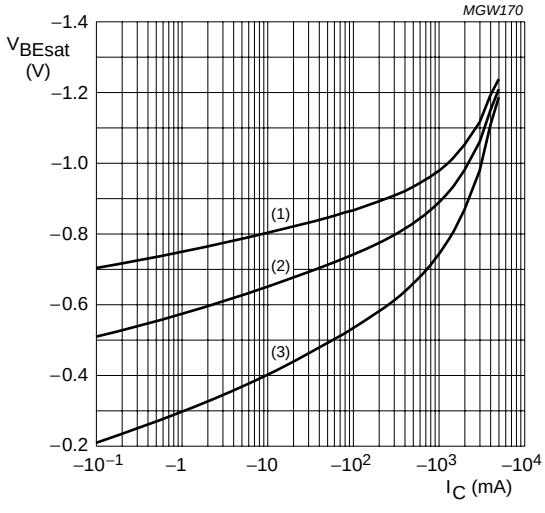
V_{CE} = −2 V.
(1) T_{amb} = −55 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = 150 °C.

Fig.3 Base-emitter voltage as a function of collector current; typical values.



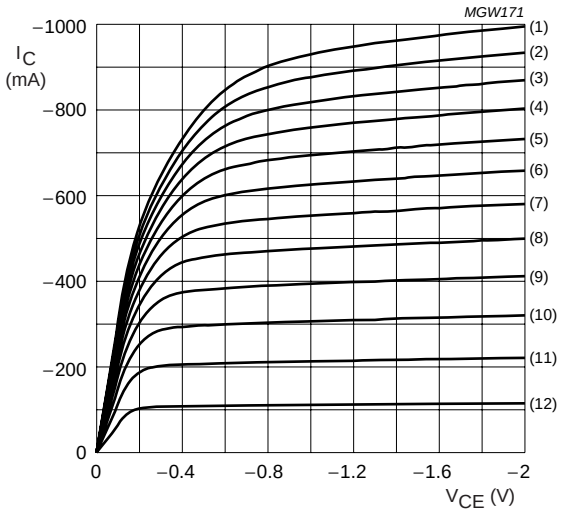
I_C/I_B = 10.
(1) T_{amb} = 150 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = −55 °C.

Fig.4 Collector-emitter saturation voltage as a function of collector current; typical values.



I_C/I_B = 10.
(1) T_{amb} = −55 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = 150 °C.

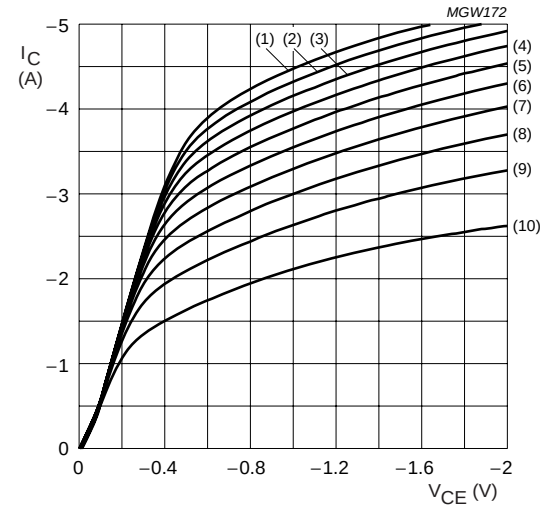
Fig.5 Base-emitter saturation voltage as a function of collector current; typical values.



T_{amb} = 25 °C.

(1) I_B = −3.96 mA.
(2) I_B = −3.63 mA.
(3) I_B = −3.30 mA.
(4) I_B = −2.97 mA.
(5) I_B = −2.64 mA.
(6) I_B = −2.31 mA.
(7) I_B = −1.98 mA.
(8) I_B = −1.65 mA.
(9) I_B = −1.32 mA.
(10) I_B = −0.99 mA.
(11) I_B = −0.66 mA.
(12) I_B = −0.33 mA.

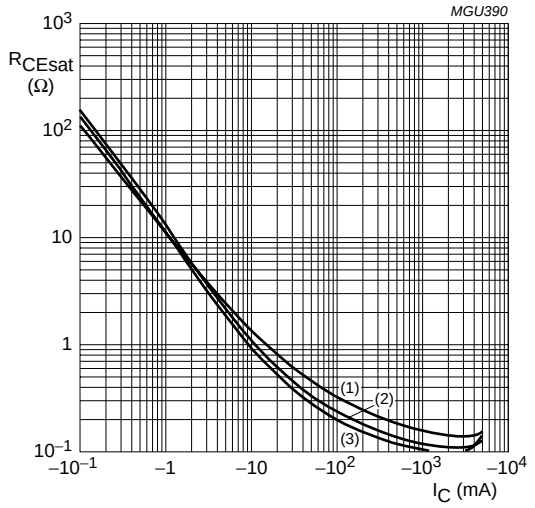
Fig.6 Collector current as a function of collector-emitter voltage; typical values.



T_{amb} = 25 °C.

(1) I_B = −250 mA.
(2) I_B = −225 mA.
(3) I_B = −200 mA.
(4) I_B = −175 mA.
(5) I_B = −150 mA.
(6) I_B = −125 mA.
(7) I_B = −100 mA.
(8) I_B = −75 mA.
(9) I_B = −50 mA.
(10) I_B = −25 mA.

Fig.7 Collector current as a function of collector-emitter voltage; typical values.



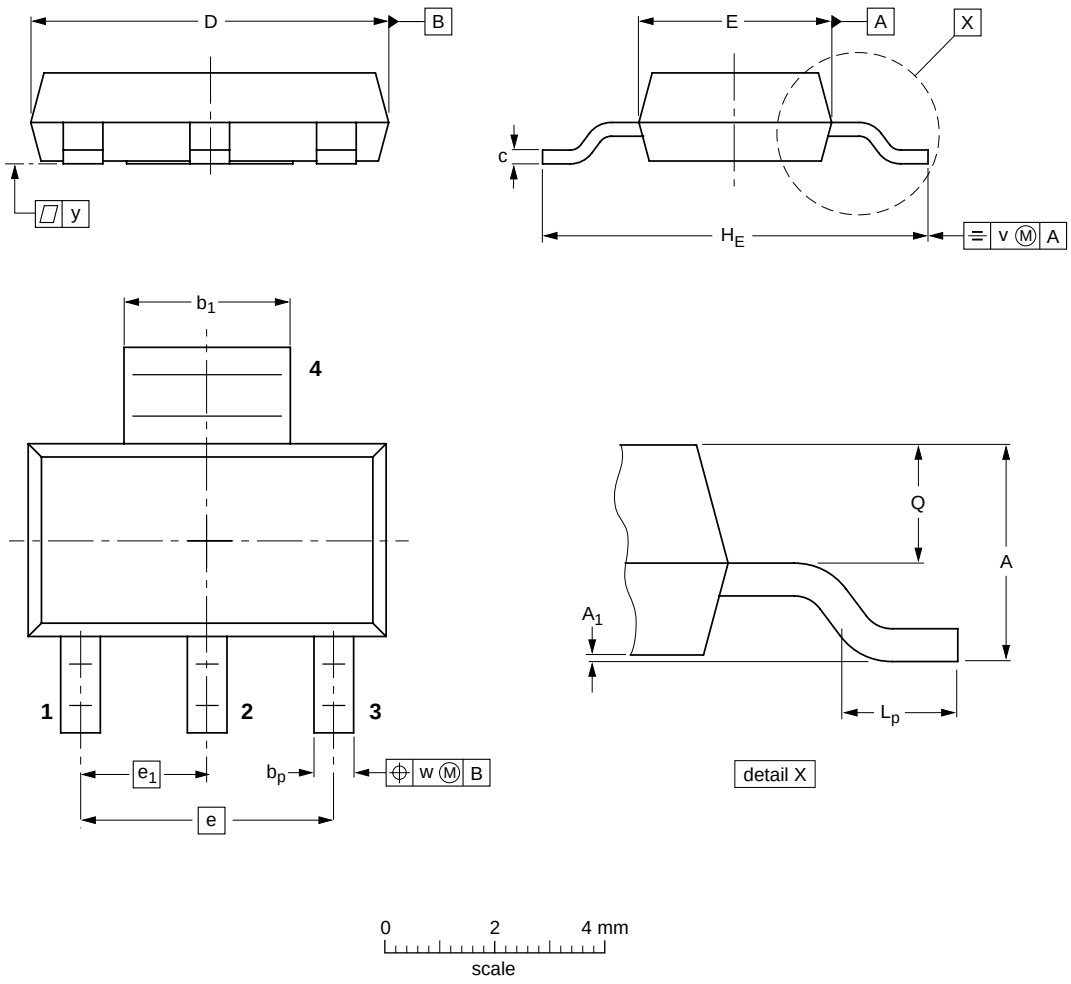
I_C/I_B = 20.

(1) T_{amb} = 150 °C. (2) T_{amb} = 25 °C. (3) T_{amb} = −55 °C.

Fig.8 Collector-emitter equivalent on-resistance as a function of collector current; typical values.

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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Printed in The Netherlands 613514/04/pp9 Date of release: 2003 May 13 Document order number: 9397 750 11058