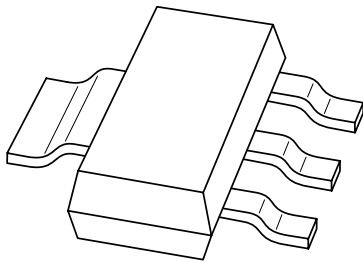


DATA SHEET



PBSS4350Z

50 V low V_{CEsat} NPN transistor

Product data sheet
Supersedes data of 2003 Jan 20

2003 May 13

50 V low V_{CEsat} NPN transistor

PBSS4350Z

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

NPN low V_{CEsat} transistor in a SOT223 plastic package.
PNP complement: PBSS5350Z.

MARKING

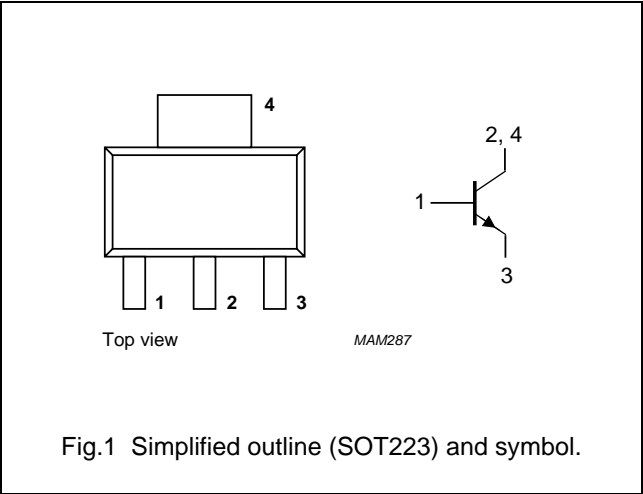
TYPE NUMBER	MARKING CODE
PBSS4350Z	PB4350

QUICK REFERENCE DATA

SYMBOL	PARAMETER	MAX.	UNIT
V_{CEO}	collector-emitter voltage	50	V
I_{CM}	peak collector current	5	A
R_{CEsat}	equivalent on-resistance	<145	m Ω

PINNING

PIN	DESCRIPTION
1	base
2	collector
3	emitter
4	collector



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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	$T_{amb} \leq 25\text{ °C}$; notes 1 and 3	–	1.35	W
		$T_{amb} \leq 25\text{ °C}$; 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 cm².
2. Device mounted on a printed-circuit board; single sided copper; tinplated; mounting pad for collector 6 cm².
3. For other mounting conditions see “*Thermal considerations for SOT223 in the General Part of associated Handbook*”.

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-a}$	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 cm².
2. Device mounted on a printed-circuit board; single sided copper; tinplated; mounting pad for collector 6 cm².
3. For other mounting conditions see “*Thermal considerations for SOT223 in the General Part of associated Handbook*”.

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CHARACTERISTICS

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

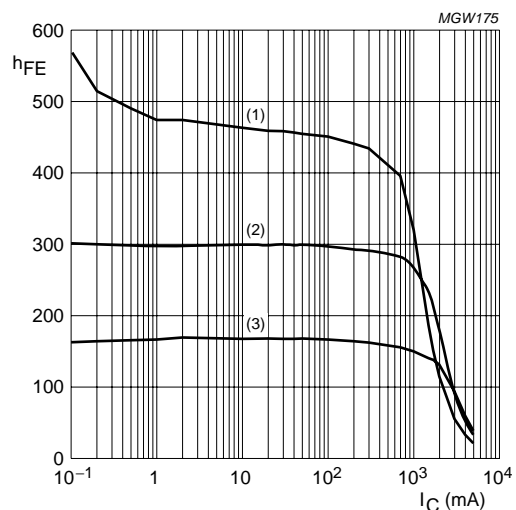
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_{CBO}	collector-base cut-off current	$V_{CB} = 50\text{ V}; I_E = 0$	–	–	100	nA
		$V_{CB} = 50\text{ V}; I_E = 0; T_J = 150\text{ }^{\circ}\text{C}$	–	–	50	μA
I_{EBO}	emitter-base cut-off current	$V_{EB} = 5\text{ V}; I_C = 0$	–	–	100	nA
h_{FE}	DC current gain	$V_{CE} = 2\text{ V}; I_C = 500\text{ mA}$	200	–	–	
		$V_{CE} = 2\text{ V}; I_C = 1\text{ A}; \text{note 1}$	200	–	–	
		$V_{CE} = 2\text{ V}; I_C = 2\text{ A}; \text{note 1}$	100	–	–	
V_{CEsat}	collector-emitter saturation voltage	$I_C = 500\text{ mA}; I_B = 50\text{ mA}$	–	–	90	mV
		$I_C = 1\text{ A}; I_B = 50\text{ mA}$	–	–	170	mV
		$I_C = 2\text{ A}; I_B = 200\text{ mA}; \text{note 1}$	–	–	290	mV
R_{CEsat}	equivalent on-resistance	$I_C = 2\text{ A}; I_B = 200\text{ mA}; \text{note 1}$	–	110	<145	$\text{m}\Omega$
V_{BEsat}	base-emitter saturation voltage	$I_C = 2\text{ A}; I_B = 200\text{ mA}; \text{note 1}$	–	–	1.2	V
V_{BEon}	base-emitter turn-on voltage	$V_{CE} = 2\text{ V}; I_C = 1\text{ A}; \text{note 1}$	–	–	1.1	V
f_T	transition frequency	$I_C = 100\text{ mA}; V_{CE} = 5\text{ V}; f = 100\text{ MHz}$	100	–	–	MHz
C_c	collector capacitance	$V_{CB} = 10\text{ V}; I_E = I_C = 0; f = 1\text{ MHz}$	–	–	30	pF

Note

1. Pulse test: $t_p \leq 300\text{ }\mu\text{s}$; $\delta \leq 0.02$.

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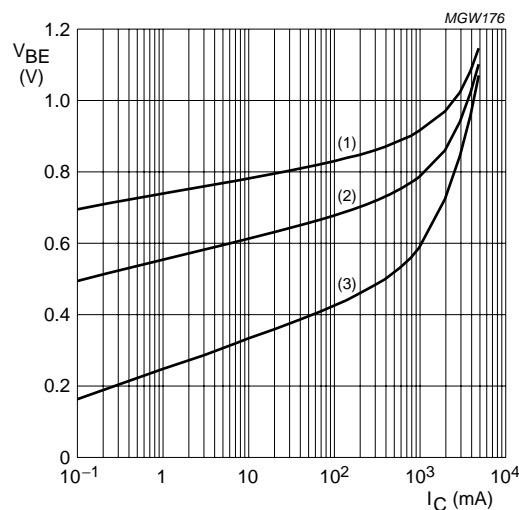
$V_{CE} = 2 \text{ V.}$

(1) $T_{amb} = 150 \text{ }^{\circ}\text{C.}$

(2) $T_{amb} = 25 \text{ }^{\circ}\text{C.}$

(3) $T_{amb} = -55 \text{ }^{\circ}\text{C.}$

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



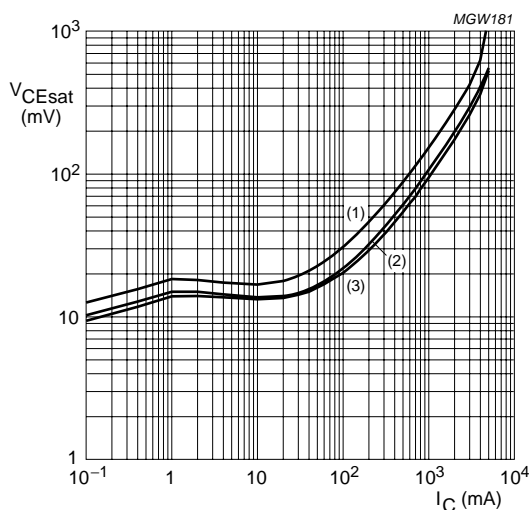
$V_{CE} = 2 \text{ V.}$

(1) $T_{amb} = -55 \text{ }^{\circ}\text{C.}$

(2) $T_{amb} = 25 \text{ }^{\circ}\text{C.}$

(3) $T_{amb} = 150 \text{ }^{\circ}\text{C.}$

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



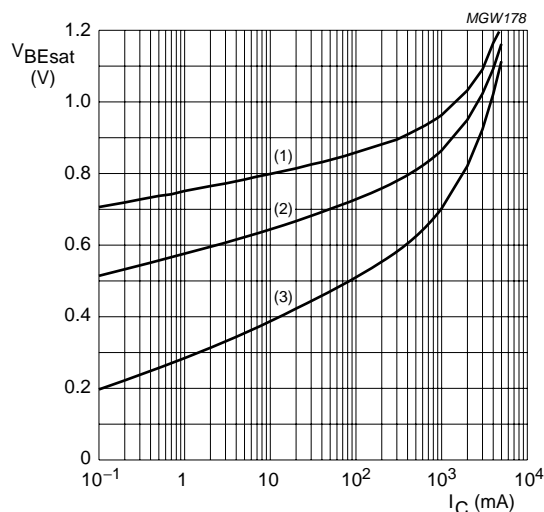
$I_C/I_B = 20.$

(1) $T_{amb} = 150 \text{ }^{\circ}\text{C.}$

(2) $T_{amb} = 25 \text{ }^{\circ}\text{C.}$

(3) $T_{amb} = -55 \text{ }^{\circ}\text{C.}$

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



$I_C/I_B = 20.$

(1) $T_{amb} = 150 \text{ }^{\circ}\text{C.}$

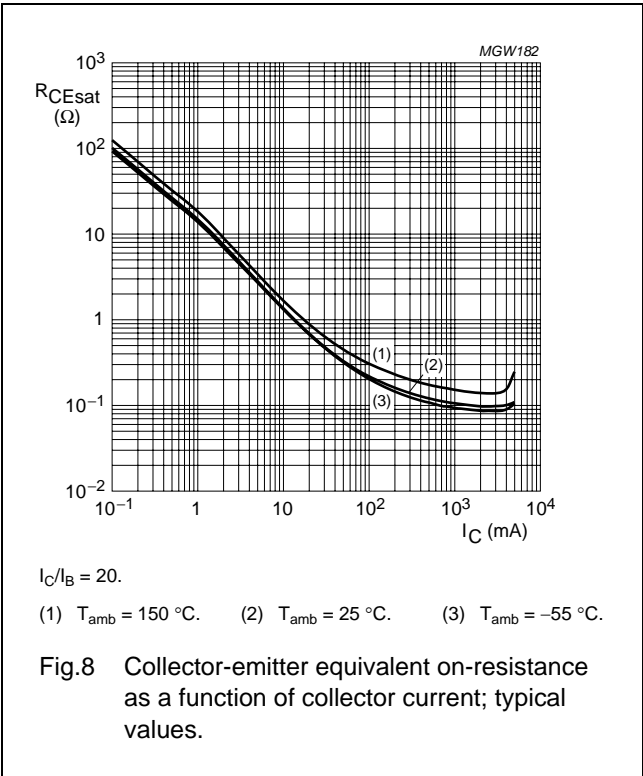
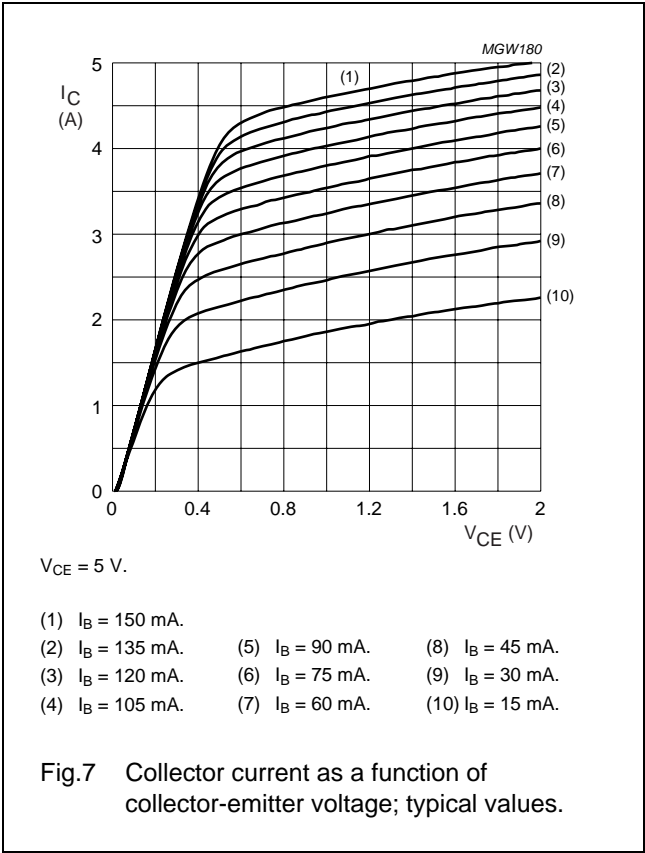
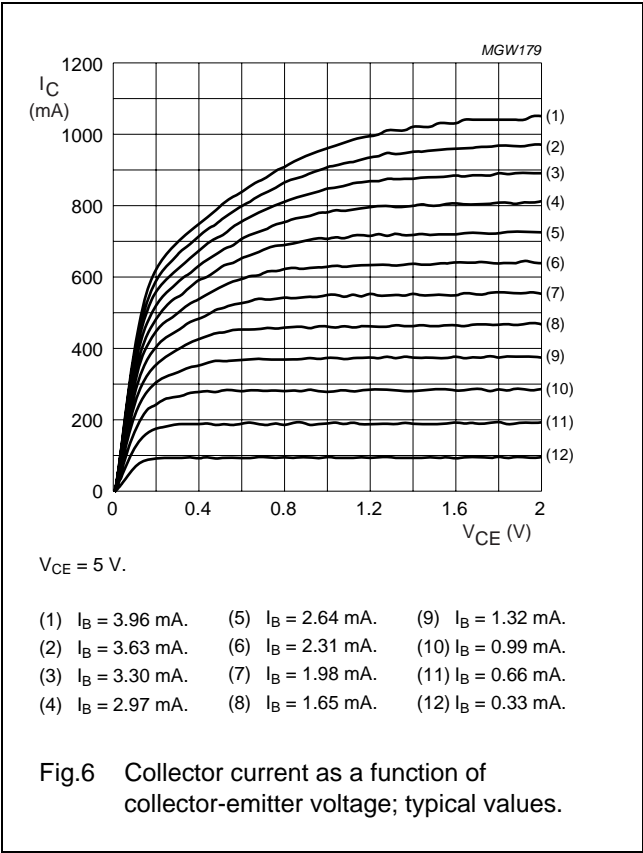
(2) $T_{amb} = 25 \text{ }^{\circ}\text{C.}$

(3) $T_{amb} = -55 \text{ }^{\circ}\text{C.}$

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

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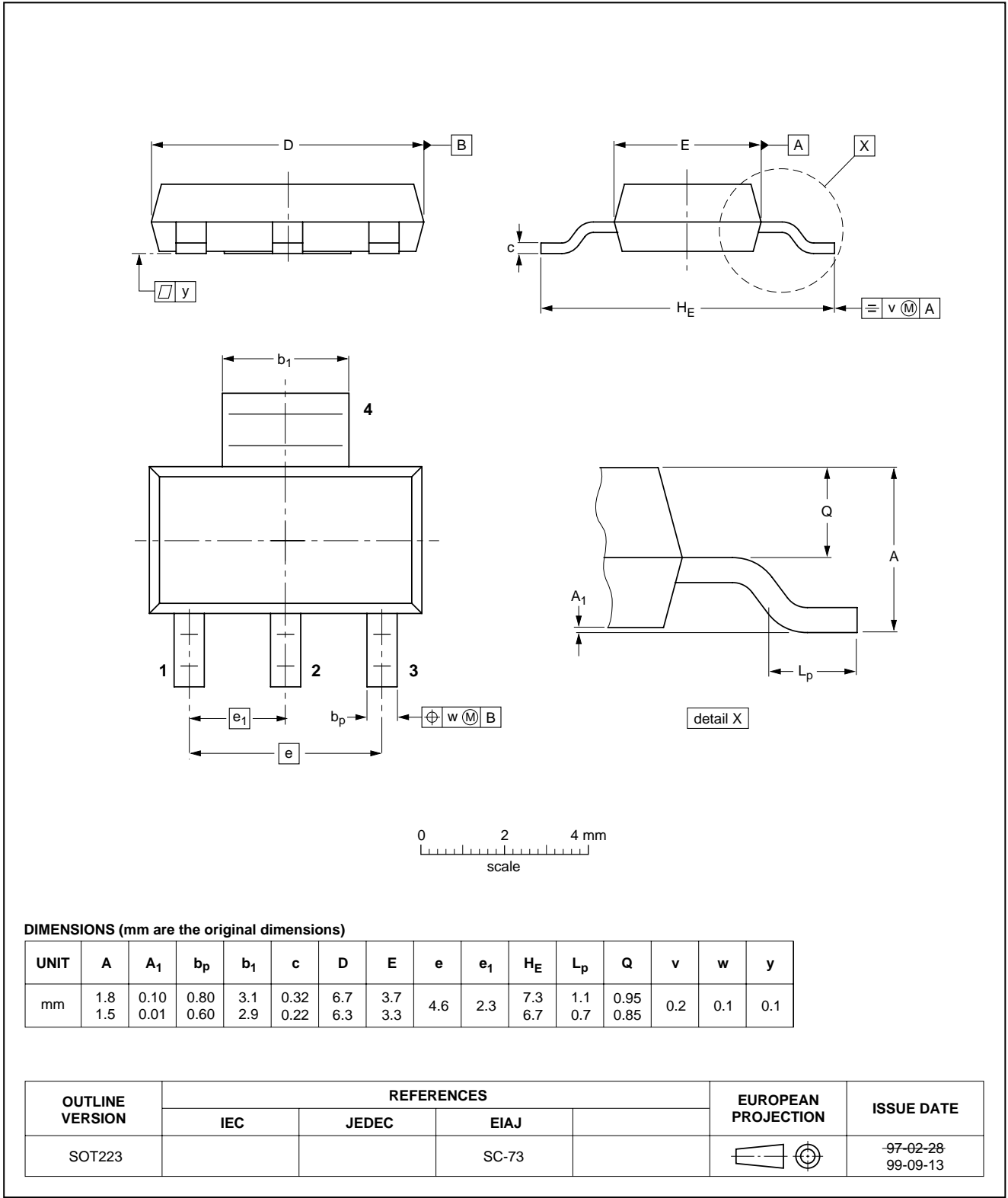
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PACKAGE OUTLINE

Plastic surface mounted package; collector pad for good heat transfer; 4 leads

SOT223



50 V low V_{CEsat} NPN transistor

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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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