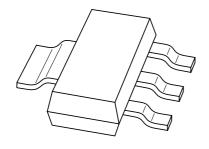
DISCRETE SEMICONDUCTORS

DATA SHEET



PBSS4350Z50 V low V_{CEsat} NPN transistor

Product specification 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 (hFE) at high IC
- 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, LFDs
 - Inductive load driver, e.g. relays, buzzers, motors.

DESCRIPTION

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

MARKING

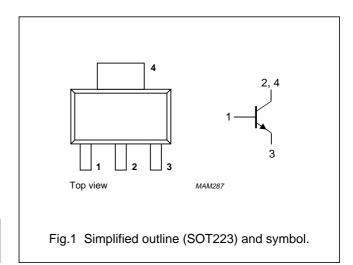
TYPE NUMBER	MARKING CODE
PBSS4350Z	PB4350

QUICK REFERENCE DATA

SYMBOL	PARAMETER	MAX.	UNIT
V_{CEO}	collector-emitter voltage	50	V
I _{CM}	peak collector current	5	Α
R _{CEsat}	equivalent on-resistance	<145	mΩ

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	PARAMETER CONDITIONS				
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	Α	
I _{CM}	peak collector current		_	5	Α	
I _{BM}	peak base current		_	1	Α	
P _{tot}	total power dissipation	T _{amb} ≤ 25 °C; notes 1 and 3	_	1.35	W	
		T _{amb} ≤ 25 °C; notes 2 and 3	_	2	W	
T _{stg}	storage temperature		-65	+150	°C	
Tj	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 °C unless otherwise specified.

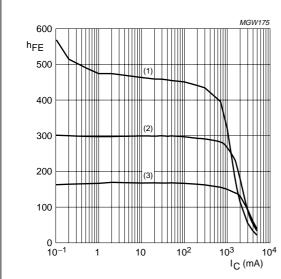
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I _{CBO}	collector-base cut-off current	V _{CB} = 50 V; I _E = 0	_	_	100	nA
		V _{CB} = 50 V; I _E = 0; T _j = 150 °C	_	_	50	μΑ
I _{EBO}	emitter-base cut-off current	V _{EB} = 5 V; I _C = 0	_	_	100	nA
h _{FE}	DC current gain	V _{CE} = 2 V; I _C = 500 mA	200	_	_	
		V _{CE} = 2 V; I _C = 1 A; note 1	200	_	_	
		V _{CE} = 2 V; I _C = 2 A; note 1	100	_	_	
V _{CEsat}	collector-emitter saturation	I _C = 500 mA; I _B = 50 mA	_	_	90	mV
	voltage	I _C = 1 A; I _B = 50 mA	_	_	170	mV
		I _C = 2 A; I _B = 200 mA; note 1	_	_	290	mV
R _{CEsat}	equivalent on-resistance	I _C = 2 A; I _B = 200 mA; note 1	_	110	<145	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	$V_{CB} = 10 \text{ V}; I_E = I_e = 0; f = 1 \text{ MHz}$	_	_	30	pF

Note

^{1.} Pulse test: $t_p \le 300~\mu s;~\delta \le 0.02.$

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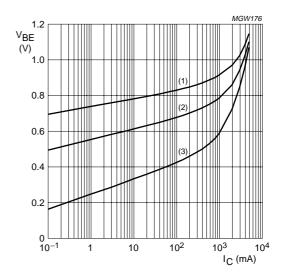
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 $V_{CE} = 2 V$.

- (1) T_{amb} = 150 °C.
- (2) $T_{amb} = 25 \, ^{\circ}C$.
- (3) $T_{amb} = -55 \, ^{\circ}C$.

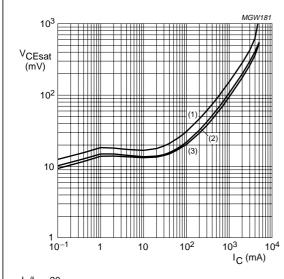
Fig.2 DC current gain as a function of collector current; typical values.



 $V_{CE} = 2 V$.

- (1) $T_{amb} = -55 \, ^{\circ}C$.
- (2) $T_{amb} = 25 C$.
- (3) $T_{amb} = 150 \, ^{\circ}C$.

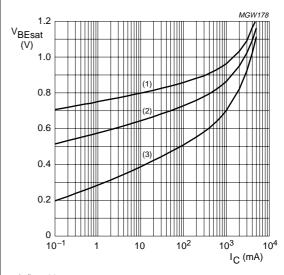
Fig.3 Base-emitter voltage as a function of collector-current; typical values.



 $I_{\rm C}/I_{\rm B}=20.$

- (1) $T_{amb} = 150 \, ^{\circ}C$.
- (2) $T_{amb} = 25 \, ^{\circ}C$.
- (3) $T_{amb} = -55 \, ^{\circ}C$.

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



 $I_{\rm C}/I_{\rm B} = 20.$

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- (1) $T_{amb} = 150 \, ^{\circ}C$.
- (2) $T_{amb} = 25 \, ^{\circ}C$.
- (3) $T_{amb} = -55 \, ^{\circ}C$.

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

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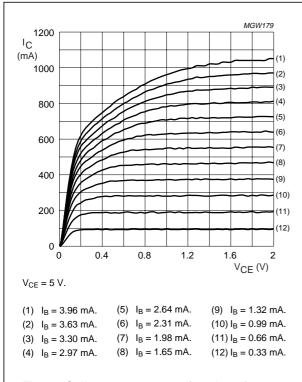
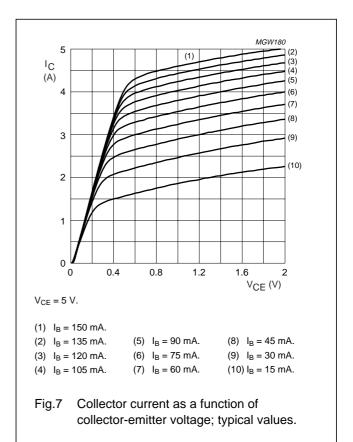
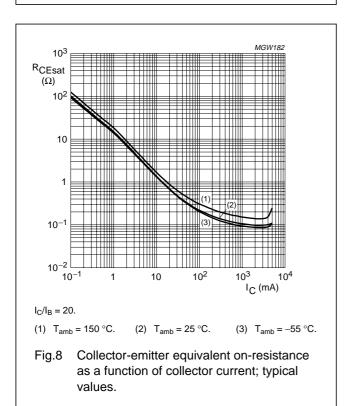


Fig.6 Collector current as a function of collector-emitter voltage; typical values.





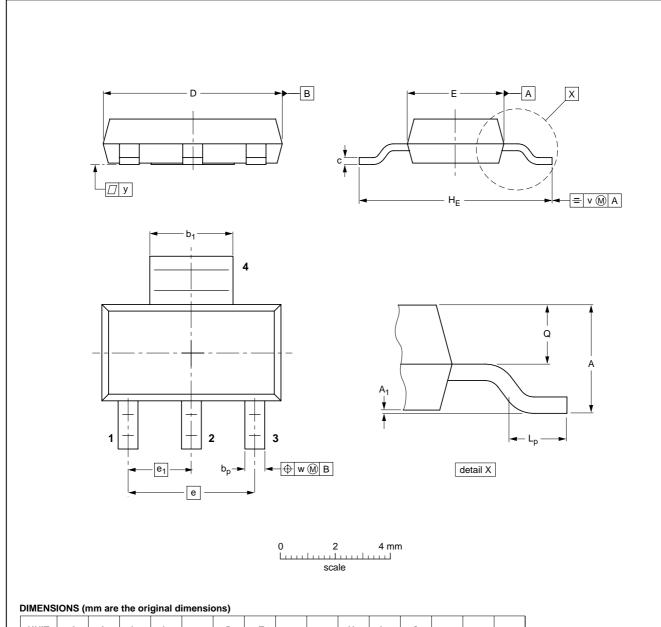
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PACKAGE OUTLINE

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

SOT223



UNIT	Α	A ₁	bp	b ₁	С	D	E	е	e ₁	H _E	Lp	Q	v	w	у
mm	1.8 1.5	0.10 0.01	0.80	3.1 2.9	0.32	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		REFER	EUROPEAN	ICCUE DATE		
VERSION	IEC	JEDEC	EIAJ		PROJECTION	ISSUE DATE
SOT223			SC-73			97-02-28 99-09-13

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DATA SHEET STATUS

LEVEL	DATA SHEET STATUS ⁽¹⁾	PRODUCT STATUS(2)(3)	DEFINITION
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Limiting values definition — Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 60134). 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.

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NOTES

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Contact information

For additional information please visit http://www.semiconductors.philips.com. Fax: +31 40 27 24825 For sales offices addresses send e-mail to: sales.addresses@www.semiconductors.philips.com.

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