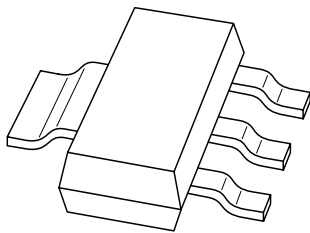


DATA SHEET



PBSS5540Z PNP Transistor

Product specification
Supersedes data of 1999 Aug 04

2000 Oct 25

PNP Transistor

PBSS5540Z

FEATURES

- Low V_{CEsat}
- High current capabilities.

APPLICATIONS

- Heavy duty battery powered equipment (automotive, telecom and audio video) such as motor and lamp drivers
- V_{CEsat} critical applications such as latest low supply voltage IC applications
- All battery driven equipment to save battery power.

DESCRIPTION

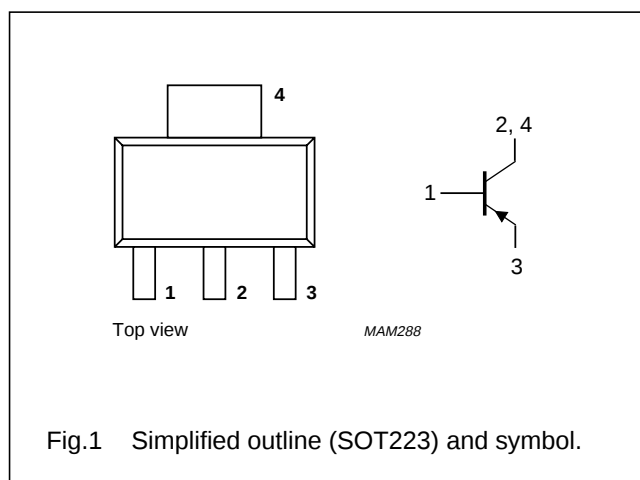
PNP low V_{CEsat} transistor in a plastic SOT223 package.
NPN complement: PBSS4540Z.

MARKING

TYPE NUMBER	MARKING CODE
PBSS5540Z	PB5540

PINNING

PIN	DESCRIPTION
1	base
2	collector
3	emitter
4	collector



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	—	−40	V
V_{CEO}	collector-emitter voltage	open base	—	−40	V
V_{EBO}	emitter-base voltage	open collector	—	−6	V
I_C	collector current (DC)		—	−5	A
I_{CM}	peak collector current		—	−10	A
I_{BM}	peak base current		—	−2	A
P_{tot}	total power dissipation	up to $T_{amb} = 25\text{ °C}$; notes 1 and 3	—	1.35	W
		up to $T_{amb} = 25\text{ °C}$; 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 cm.
2. Device mounted on a printed-circuit board; single sided copper; tinplated; mounting pad for collector 6 cm.
3. For other mounting conditions see “*Thermal considerations for SOT223 in the General Part of associated Handbook*”.

PNP Transistor

PBSS5540Z

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-a}$	thermal resistance from junction to ambient	in free air; note 1	92	K/W

Note

- Device mounted on a printed circuit board; single sided copper; tinplated; mounting pad for collector 1 cm. 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.

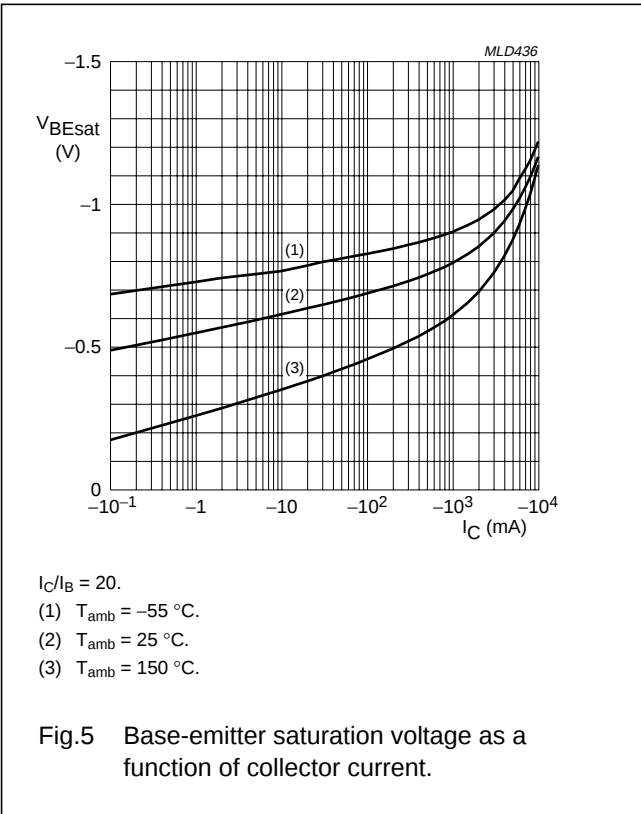
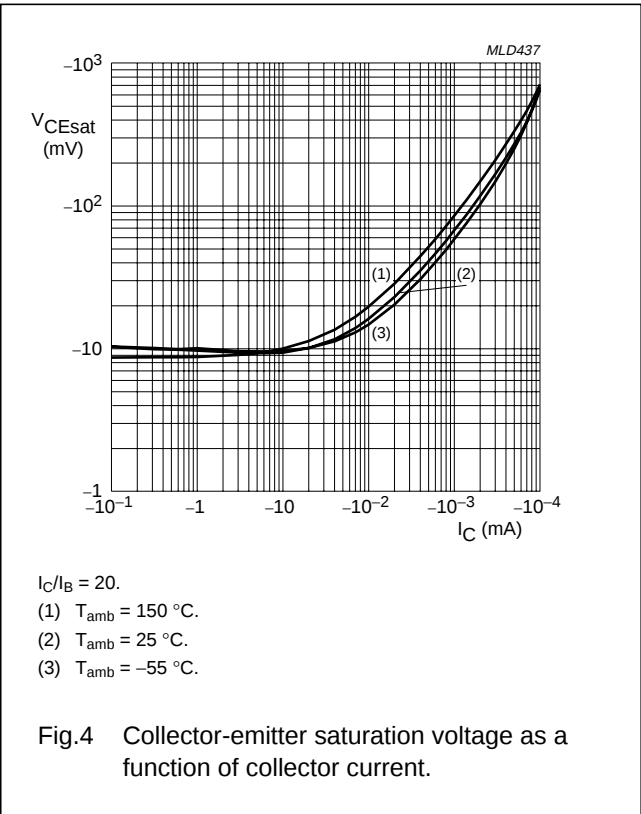
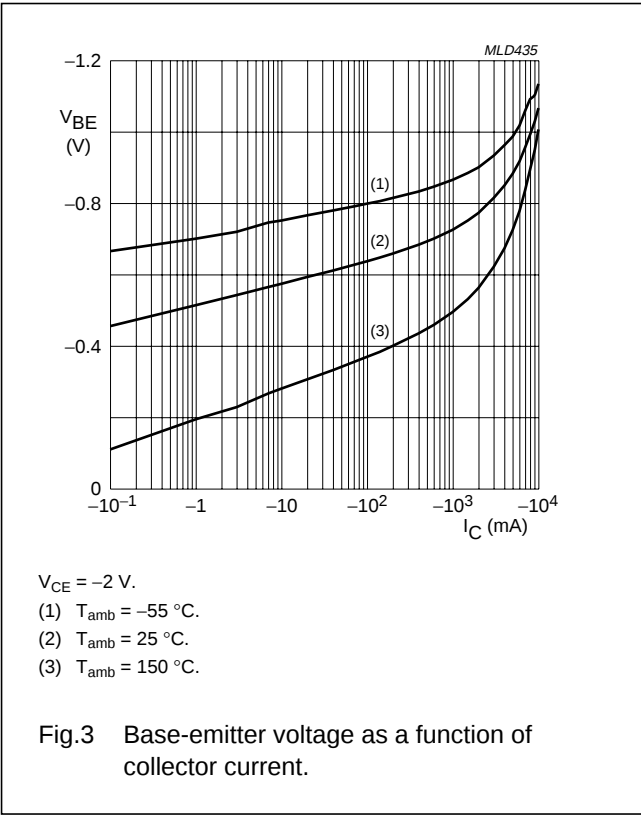
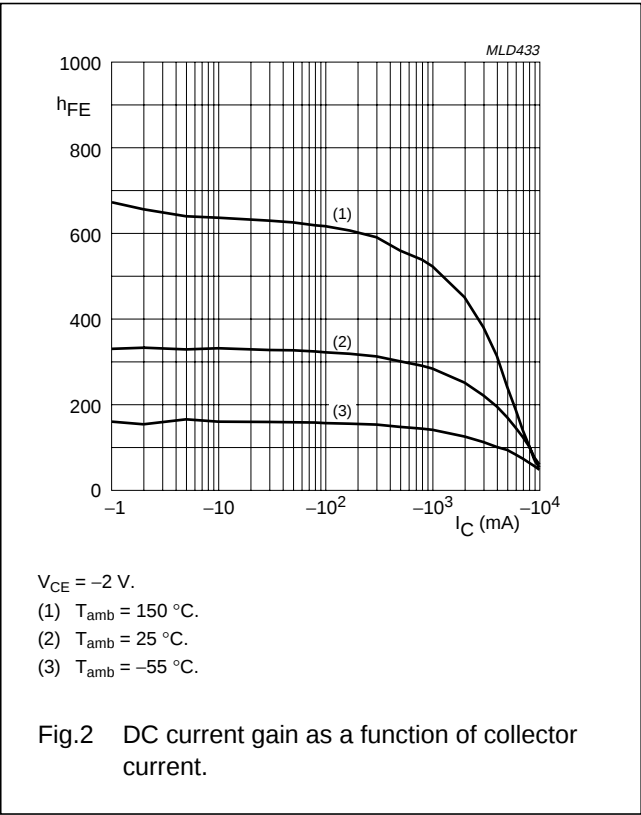
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_{CBO}	collector-base cut-off current	$V_{CB} = 30\text{ V}; I_E = 0$	–	–	–100	nA
		$V_{CB} = 30\text{ V}; I_E = 0; T_J = 150\text{ °C}$	–	–	–50	μA
I_{EBO}	emitter-base cut-off current	$V_{EB} = 5\text{ V}; I_C = 0$	–	–	–100	nA
h_{FE}	DC current gain	$V_{CE} = -2\text{ V};$ $I_C = -500\text{ mA}$	250	350	–	
		$I_C = -1\text{ A}; \text{note 1}$	200	300	–	
		$I_C = -2\text{ A}; \text{note 1}$	150	250	–	
		$I_C = -5\text{ A}; \text{note 1}$	50	150	–	
V_{CEsat}	saturation voltage	$I_C = -500\text{ mA}; I_B = -5\text{ mA}$	–	–80	–120	mV
		$I_C = -1\text{ A}; I_B = -10\text{ mA}$	–	–120	–170	mV
		$I_C = -2\text{ A}; I_B = -200\text{ mA}$	–	–110	–160	mV
		$I_C = -5\text{ A}; I_B = -500\text{ mA}$	–	–250	–375	mV
V_{BEsat}	saturation voltage	$I_C = -5\text{ A}; I_B = -500\text{ mA}$	–	–	–1.3	V
V_{BEon}	base-emitter turn on voltage	$V_{CE} = -2\text{ V}; I_C = -2\text{ A}$	–	–0.8	–1.25	V
f_T	transition frequency	$I_C = -100\text{ mA}; V_{CE} = -10\text{ V};$ $f = 100\text{ MHz}$	60	120	–	MHz
C_c	collector capacitance	$V_{CB} = -10\text{ V}; I_E = I_C = 0; f = 1\text{ MHz}$	–	90	105	pF

Note

- Pulsed conditions $t_p \leq 300\text{ }\mu\text{s}$; $\delta \leq 0.02$.

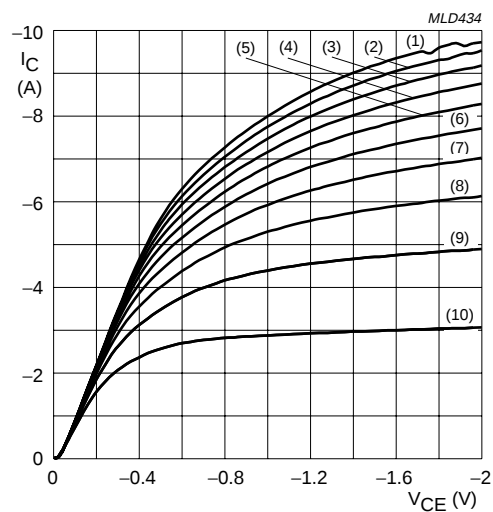
PNP Transistor

PBSS5540Z



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

- | | |
|----------------------------|----------------------------|
| (1) $I_B = 150\text{ mA}.$ | (6) $I_B = 75\text{ mA}.$ |
| (2) $I_B = 135\text{ mA}.$ | (7) $I_B = 60\text{ mA}.$ |
| (3) $I_B = 120\text{ mA}.$ | (8) $I_B = 45\text{ mA}.$ |
| (4) $I_B = 105\text{ mA}.$ | (9) $I_B = 30\text{ mA}.$ |
| (5) $I_B = 90\text{ mA}.$ | (10) $I_B = 15\text{ mA}.$ |

Fig.6 Collector current as a function of base current and collector-emitter voltage.

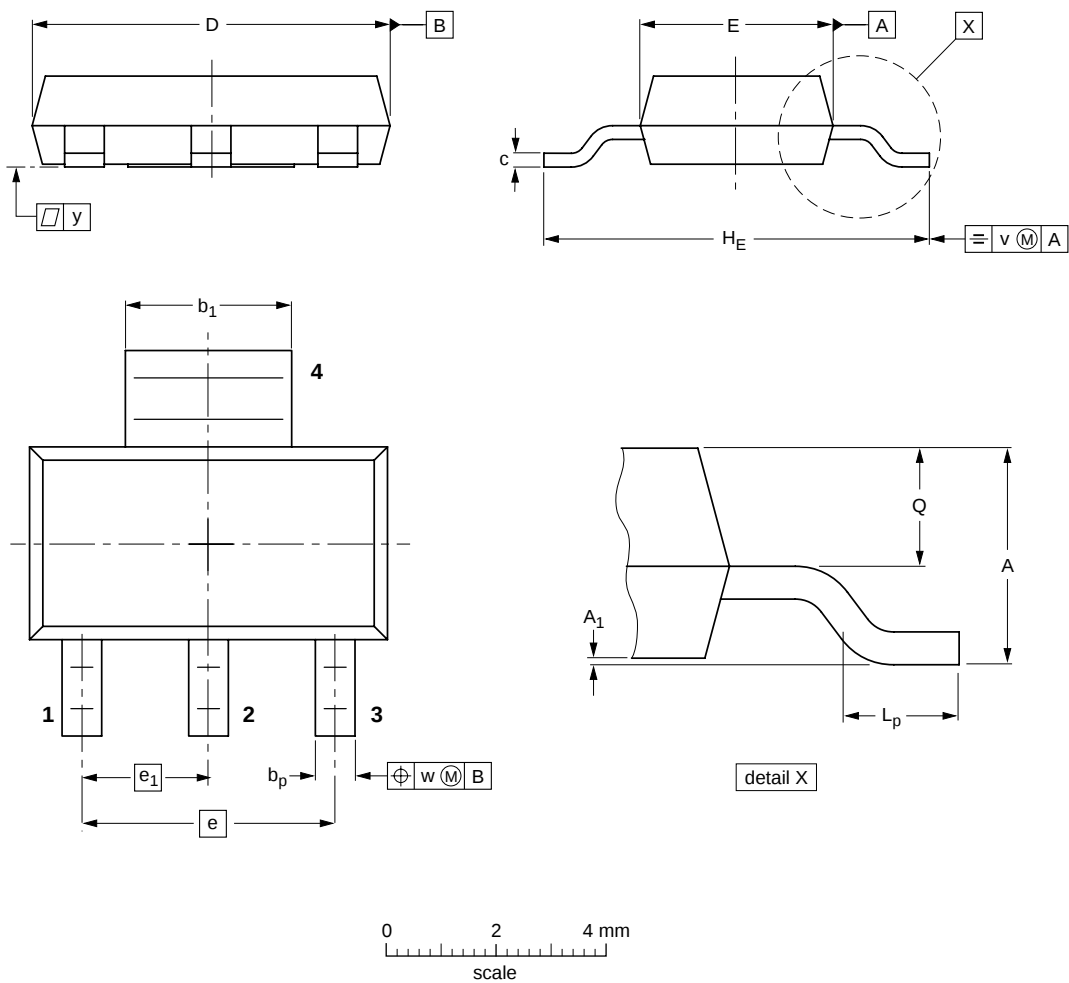
PNP Transistor

PBSS5540Z

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

PNP Transistor

PBSS5540Z

DATA SHEET STATUS

DATA SHEET STATUS	PRODUCT STATUS	DEFINITIONS ⁽¹⁾
Objective specification	Development	This data sheet contains the design target or goal specifications for product development. Specification may change in any manner without notice.
Preliminary specification	Qualification	This data sheet contains preliminary data, and supplementary data will be published at a later date. Philips Semiconductors reserves the right to make changes at any time without notice in order to improve design and supply the best possible product.
Product specification	Production	This data sheet contains final specifications. Philips Semiconductors reserves the right to make changes at any time without notice in order to improve design and supply the best possible product.

Note

1. Please consult the most recently issued data sheet before initiating or completing a design.

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Short-form specification — The data in a short-form specification is extracted from a full data sheet with the same type number and title. For detailed information see the relevant data sheet or data handbook.

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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Printed in The Netherlands

613514/02/pp8

Date of release: 2000 Oct 25

Document order number: 9397 750 07473

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