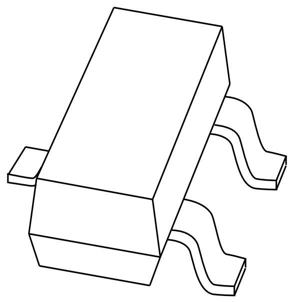
DISCRETE SEMICONDUCTORS

DATA SHEET



PBSS5350T

50 V, 3 A
PNP low V_{CEsat} (BISS) transistor

Product data sheet 2004 Jan 13

Supersedes data of 2002 Aug 08

founded by Philips

50 V, 3 A PNP low V_{CEsat} (BISS) transistor

PBSS5350T

FEATURES

- Low collector-emitter saturation voltage V_{CEsat} and corresponding low R_{CEsat}
- High collector current capability
- High collector current gain
- Improved efficiency due to reduced heat generation.

APPLICATIONS

- Power management applications
- Low and medium power DC/DC convertors
- Supply line switching
- Battery chargers
- Linear voltage regulation with low voltage drop-out (LDO).

DESCRIPTION

PNP low V_{CEsat} transistor in a SOT23 plastic package.
NPN complement: PBSS4350T.

MARKING

TYPE NUMBER	MARKING CODE[1]
PBSS5350T	ZD*

Note

1. * = p: Made in Hong Kong.
   * = t: Made in Malaysia.
   * = W: Made in China.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	MAX.	UNIT
V_{CEO}	collector-emitter voltage	–50	V
I_C	collector current (DC)	–2	A
I_{CRP}	repetitive peak collector current	–3	A
R_{CEsat}	equivalent on-resistance	135	mΩ

PINNING

PIN	DESCRIPTION
1	base
2	emitter
3	collector

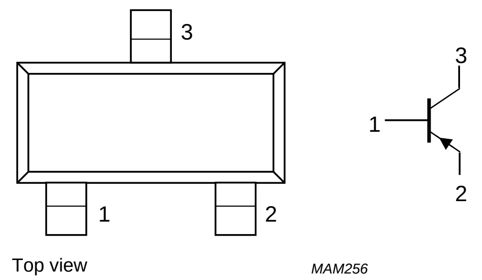


Fig.1 Simplified outline (SOT23) and symbol.

ORDERING INFORMATION

TYPENUMBER	PACKAGE		
	NAME	DESCRIPTION	VERSION
PBSS5350T	–	plastic surface mounted package; 3 leads	SOT23

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	–	–50	V
V_{CEO}	collector-emitter voltage	open base	–	–50	V
V_{EBO}	emitter-base voltage	open collector	–	–5	V
I_C	collector current (DC)		–	–2	A
I_{CRP}	repetitive peak collector current	note 1	–	–3	A
I_{CM}	peak collector current	single peak	–	–5	A
I_B	base current (DC)		–	–0.5	A
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C; note 2	–	300	mW
		$T_{amb} \leq 25$ °C; note 3	–	480	mW
		$T_{amb} \leq 25$ °C; note 4	–	540	mW
		$T_{amb} \leq 25$ °C; notes 1 and 2	–	1.2	W
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C
T_{amb}	operating ambient temperature		–65	+150	°C

Notes

1. Operated under pulsed conditions: pulse width $t_p \leq 100$ ms; duty cycle $\delta \leq 0.25$.
2. Device mounted on a printed-circuit board; single sided copper; tinplated; standard footprint.
3. Device mounted on a printed-circuit board; single sided copper; tinplated; mounting pad for collector 1 cm^2.
4. Device mounted on a printed-circuit board; single sided copper; tinplated; mounting pad for collector 6 cm^2.

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ (j-a)}$	thermal resistance from junction to ambient	in free air; note 1	417	K/W
		in free air; note 2	260	K/W
		in free air; note 3	230	K/W
		in free air; notes 1 and 4	104	K/W

Notes

1. Device mounted on a printed-circuit board; single sided copper; tinplated; standard footprint.
2. Device mounted on a printed-circuit board; single sided copper; tinplated; mounting pad for collector 1 cm^2.
3. Device mounted on a printed-circuit board; single sided copper; tinplated; mounting pad for collector 6 cm^2.
4. Operated under pulsed conditions: pulse width $t_p \leq 100$ ms; duty cycle $\delta \leq 0.25$.

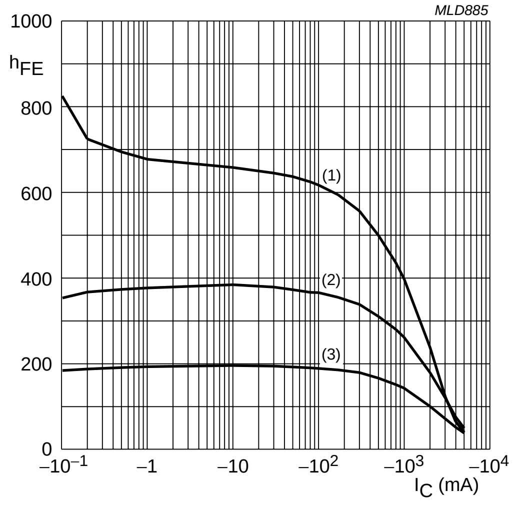
CHARACTERISTICS

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 = –100 mA	200	–	–	
		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	130	–	–	
		V_{CE} = –2 V; I_C = –3 A; note 1	80	–	–	
V_{CEsat}	collector-emitter saturation voltage	I_C = –500 mA; I_B = –50 mA	–	–	–90	mV
		I_C = –1 A; I_B = –50 mA	–	–	–180	mV
		I_C = –2 A; I_B = –100 mA; note 1	–	–	–320	mV
		I_C = –2 A; I_B = –200 mA; note 1	–	–	–270	mV
		I_C = –3 A; I_B = –300 mA; note 1	–	–	–390	mV
R_{CEsat}	equivalent on-resistance	I_C = –2 A; I_B = –200 mA; note 1	–	90	135	mΩ
V_{BEsat}	base-emitter saturation voltage	I_C = –2 A; I_B = –100 mA; note 1	–	–	–1.1	V
		I_C = –3 A; I_B = –300 mA; note 1	–	–	–1.2	V
V_{BEon}	base-emitter turn-on voltage	V_{CE} = –2 V; I_C = –1 A; note 1	–1.2	–	–	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	–	–	35	pF

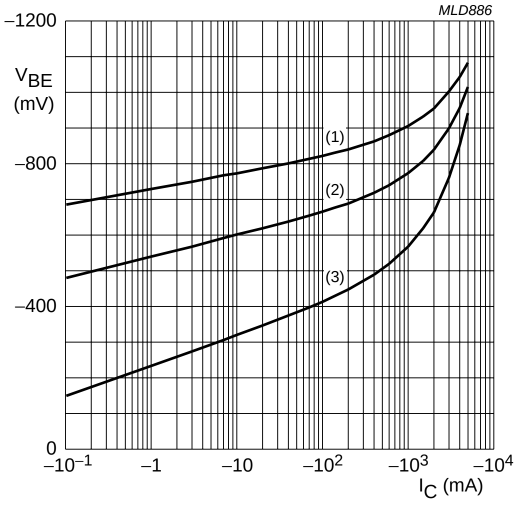
Note

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



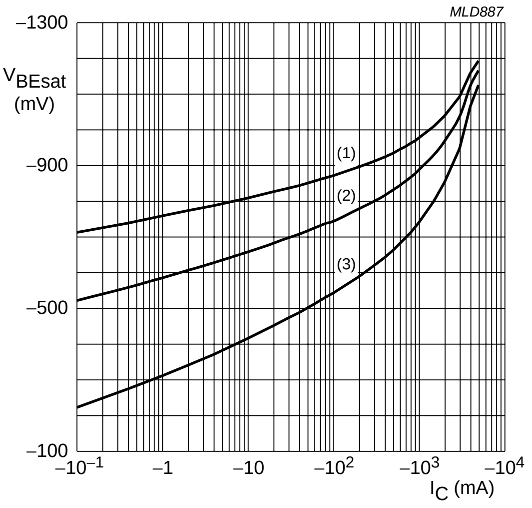
$V_{CE} = -2$ V.
(1) $T_{amb} = 150$ °C.
(2) $T_{amb} = 25$ °C.
(3) $T_{amb} = -55$ °C.

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



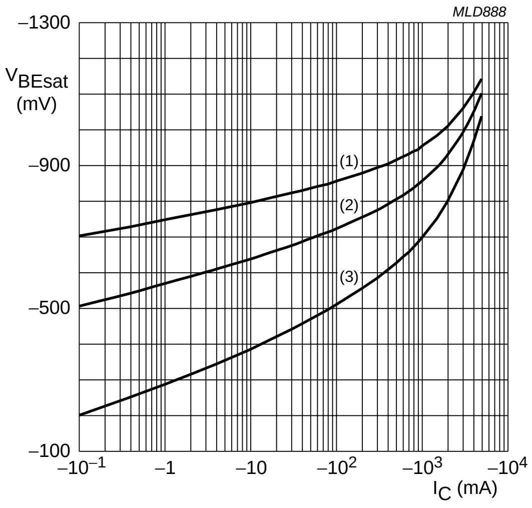
$V_{CE} = -2$ V.
(1) $T_{amb} = -55$ °C.
(2) $T_{amb} = 25$ °C.
(3) $T_{amb} = 150$ °C.

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



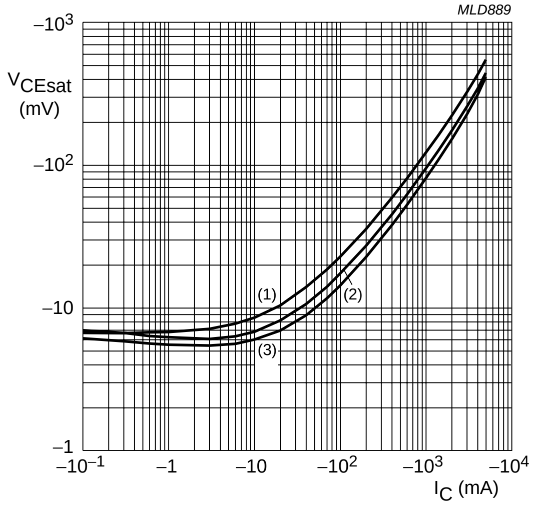
$I_C/I_B = 10$.
(1) $T_{amb} = -55$ °C.
(2) $T_{amb} = 25$ °C.
(3) $T_{amb} = 150$ °C.

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



$I_C/I_B = 20$.
(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.



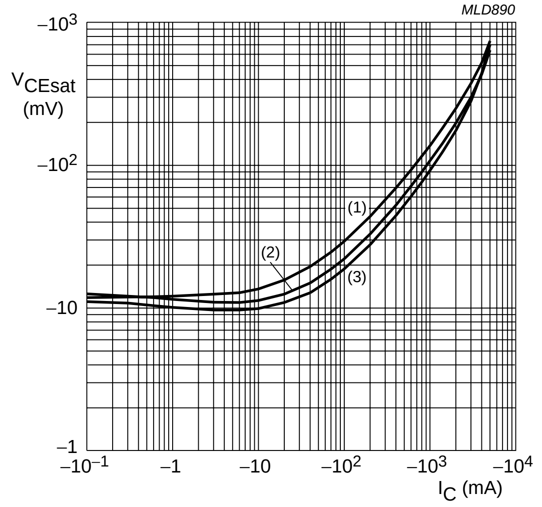
$I_C/I_B = 10$.

(1) $T_{amb} = 150$ °C.

(2) $T_{amb} = 25$ °C.

(3) $T_{amb} = -55$ °C.

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



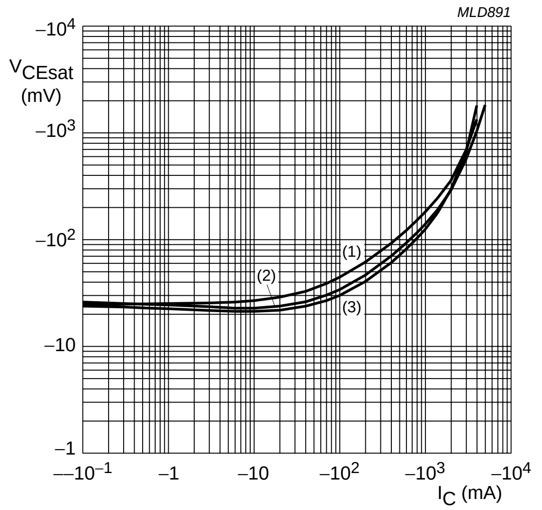
$I_C/I_B = 20$.

(1) $T_{amb} = 150$ °C.

(2) $T_{amb} = 25$ °C.

(3) $T_{amb} = -55$ °C.

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



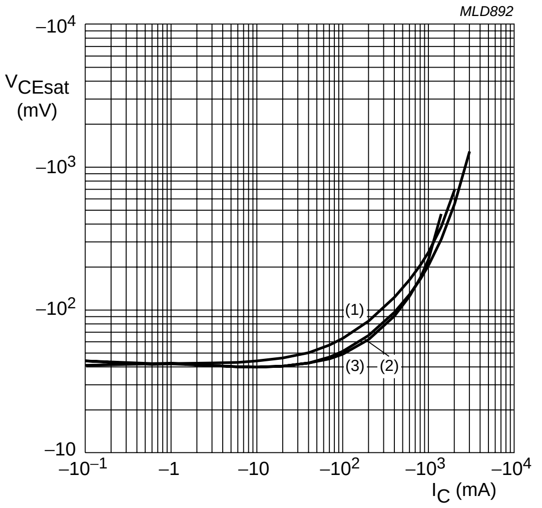
$I_C/I_B = 50$.

(1) $T_{amb} = 150$ °C.

(2) $T_{amb} = 25$ °C.

(3) $T_{amb} = -55$ °C.

Fig.8 Collector-emitter saturation voltage as a function of collector current; typical values.



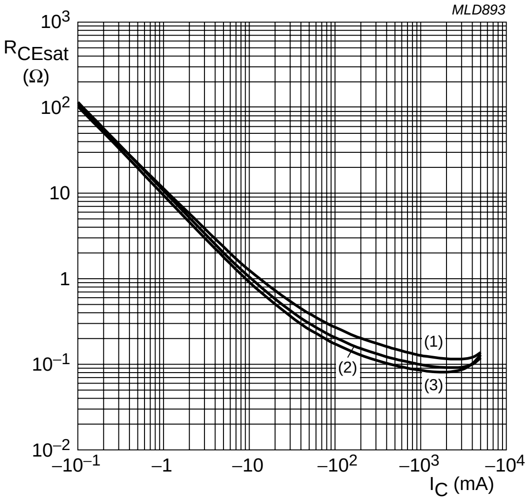
$I_C/I_B = 100$.

(1) $T_{amb} = 150$ °C.

(2) $T_{amb} = 25$ °C.

(3) $T_{amb} = -55$ °C.

Fig.9 Collector-emitter saturation voltage as a function of collector current; typical values.



I_C/I_B = 20.

(1) T_{amb} = 150 °C.

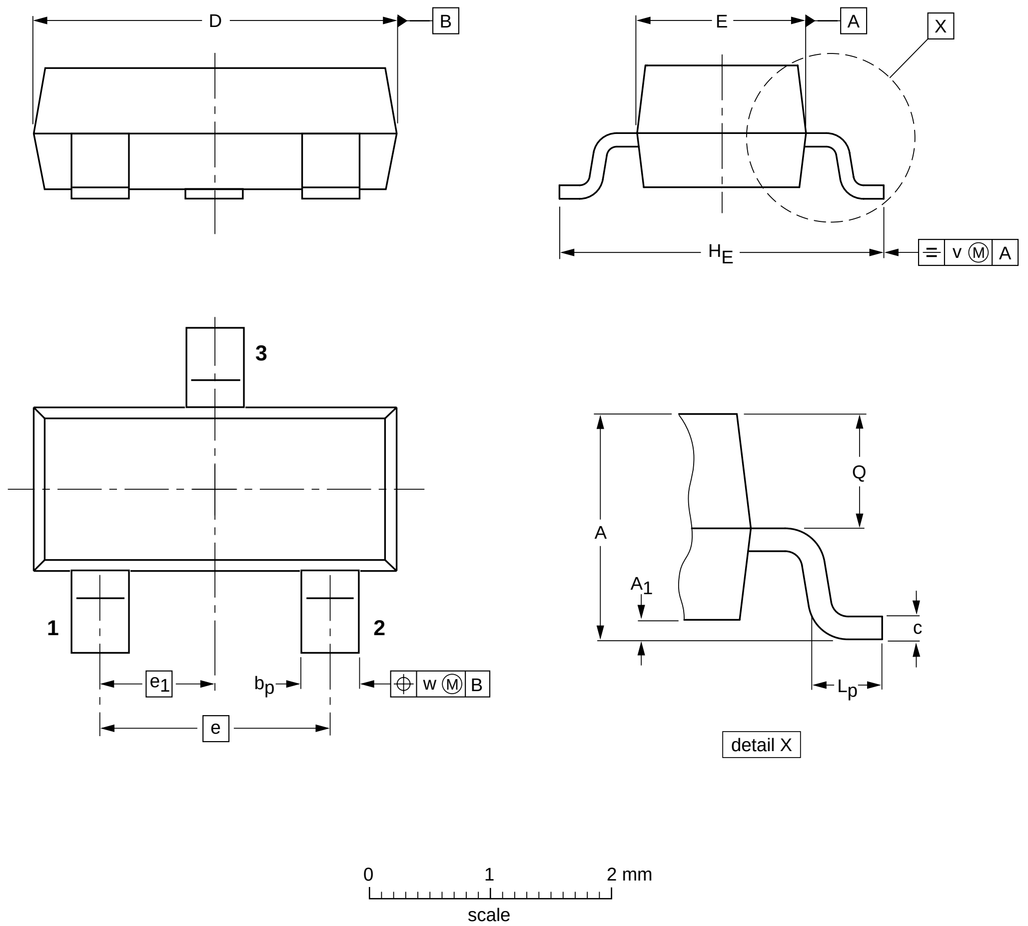
(2) T_{amb} = 25 °C.

(3) T_{amb} = −55 °C.

Fig.10 Equivalent on-resistance as a function of collector current; typical values.

PACKAGE OUTLINE

Plastic surface-mounted package; 3 leads **SOT23**



DIMENSIONS (mm are the original dimensions)

UNIT	A	A_1 max.	b_p	c	D	E	e	e_1	H_E	L_p	Q	v	w
mm	1.1 0.9	0.1	0.48 0.38	0.15 0.09	3.0 2.8	1.4 1.2	1.9	0.95	2.5 2.1	0.45 0.15	0.55 0.45	0.2	0.1

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT23		TO-236AB				~~04-11-04~~ 06-03-16