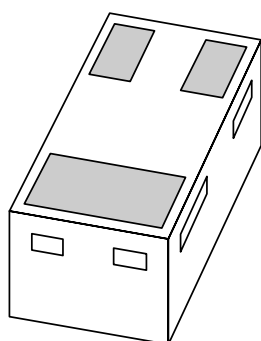


# DATA SHEET



**PBSS3515M**

15 V, 0.5 A

PNP low  $V_{CEsat}$  (BISS) transistor

Product specification

2003 Jul 22

15 V, 0.5 A  
PNP low  $V_{CEsat}$  (BISS) transistor

PBSS3515M

FEATURES

- Low collector-emitter saturation voltage  $V_{CEsat}$
- High collector current capability  $I_C$  and  $I_{CM}$
- High efficiency leading to reduced heat generation
- Reduced printed-circuit board requirements.

APPLICATIONS

- Power management:
  - DC-DC converter
  - Supply line switching
  - Battery charger
  - LCD backlighting.
- Peripheral driver:
  - Driver in low supply voltage applications (e.g. lamps and LEDs).
  - Inductive load drivers (e.g. relays, buzzers and motors).

DESCRIPTION

Low  $V_{CEsat}$  PNP transistor in a SOT883 leadless ultra small plastic package.  
NPN complement: PBSS2515M.

MARKING

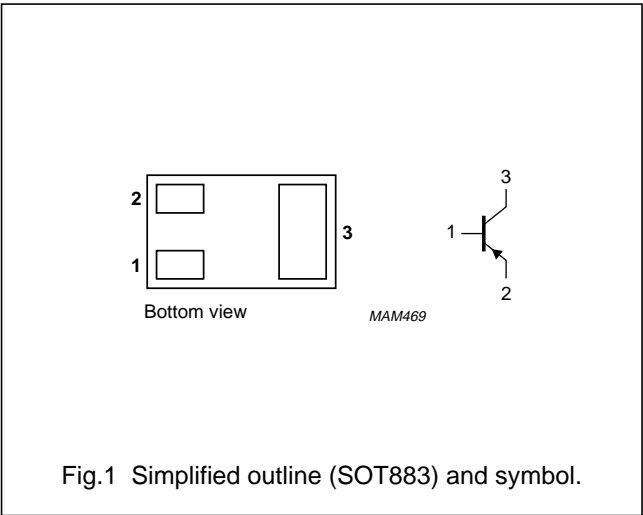
TYPE NUMBER	MARKING CODE
PBSS3515M	DB

QUICK REFERENCE DATA

SYMBOL	PARAMETER	MAX.	UNIT
$V_{CEO}$	collector-emitter voltage	−15	V
$I_C$	collector current (DC)	−500	mA
$I_{CM}$	peak collector current	−1	A
$R_{CEsat}$	equivalent on-resistance	<500	mΩ

PINNING

PIN	DESCRIPTION
1	base
2	emitter
3	collector



# 15 V, 0.5 A PNP low $V_{CEsat}$ (BISS) transistor

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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	–	–15	V
$V_{CEO}$	collector-emitter voltage	open base	–	–15	V
$V_{EBO}$	emitter-base voltage	open collector	–	–6	V
$I_C$	collector current (DC)	notes 1 and 2	–	–500	mA
$I_{CM}$	peak collector current		–	–1	A
$I_{BM}$	peak base current		–	–100	mA
$P_{tot}$	total power dissipation	$T_{amb} \leq 25\text{ °C}$ ; notes 1 and 2	–	250	mW
		$T_{amb} \leq 25\text{ °C}$ ; note 1 and 3	–	430	mW
$T_{stg}$	storage temperature		–65	+150	°C
$T_j$	junction temperature		–	150	°C
$T_{amb}$	operating ambient temperature		–65	+150	°C

## Notes

1. Refer to SOT883 standard mounting conditions.
2. Device mounted on an FR4 printed-circuit board, single-sided copper, tinplated, standard footprint, with 60  $\mu\text{m}$  copper strip line.
3. Device mounted on a printed-circuit board, single-sided copper, tinplated, mounting pad for collector 1  $\text{cm}^2$ .

## THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-a}$	thermal resistance from junction to ambient	in free air; notes 1 and 2	500	K/W
		in free air; notes 1, 3 and 4	290	K/W

## Notes

1. Refer to SOT883 standard mounting conditions.
2. Device mounted on an FR4 printed-circuit board, single-sided copper, tinplated, standard footprint, with 60  $\mu\text{m}$  copper strip line.
3. Device mounted on a printed-circuit board, single-sided copper, tinplated, mounting pad for collector 1  $\text{cm}^2$ .
4. Operated under pulsed conditions: duty cycle  $\delta \leq 20\%$ , pulse width  $t_p \leq 30\text{ ms}$ .

## Soldering

Reflow soldering is the only recommended soldering method.

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**CHARACTERISTICS** $T_{amb} = 25\text{ °C}$  unless otherwise specified.

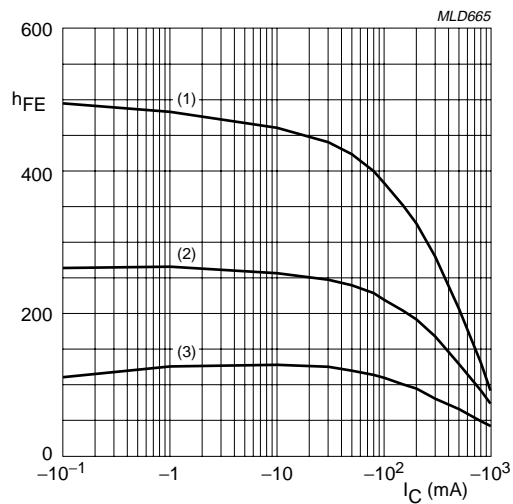
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$I_{CBO}$	collector-base cut-off current	$V_{CB} = -15\text{ V}; I_E = 0$	–	–	–100	nA
		$V_{CB} = -15\text{ V}; I_E = 0; T_J = 150\text{ °C}$	–	–	–50	$\mu\text{A}$
$I_{EBO}$	emitter-base cut-off current	$V_{EB} = -5\text{ V}; I_C = 0$	–	–	–100	nA
$h_{FE}$	DC current gain	$V_{CE} = -2\text{ V}; I_C = -10\text{ mA}$	200	–	–	
		$V_{CE} = -2\text{ V}; I_C = -100\text{ mA}$ ; note 1	150	–	–	
		$V_{CE} = -2\text{ V}; I_C = -500\text{ mA}$ ; note 1	90	–	–	
$V_{CEsat}$	collector-emitter saturation voltage	$I_C = -10\text{ mA}; I_B = -0.5\text{ mA}$	–	–	–25	mV
		$I_C = -200\text{ mA}; I_B = -10\text{ mA}$ ; note 1	–	–	–150	mV
		$I_C = -500\text{ mA}; I_B = -50\text{ mA}$ ; note 1	–	–	–250	mV
$R_{CEsat}$	equivalent on-resistance	$I_C = -500\text{ mA}; I_B = -50\text{ mA}$ ; note 1	–	300	<500	$\text{m}\Omega$
$V_{BEsat}$	base-emitter saturation voltage	$I_C = -500\text{ mA}; I_B = -50\text{ mA}$ ; note 1	–	–	–1.1	V
$V_{BEon}$	base-emitter turn-on voltage	$V_{CE} = -2\text{ V}; I_C = -100\text{ mA}$ ; note 1	–	–	–0.9	V
$f_T$	transition frequency	$I_C = -100\text{ mA}; V_{CE} = -5\text{ V};$ $f = 100\text{ MHz}$	100	280	–	MHz
$C_c$	collector capacitance	$V_{CB} = -10\text{ V}; I_E = I_e = 0; f = 1\text{ MHz}$	–	–	10	pF

**Note**

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

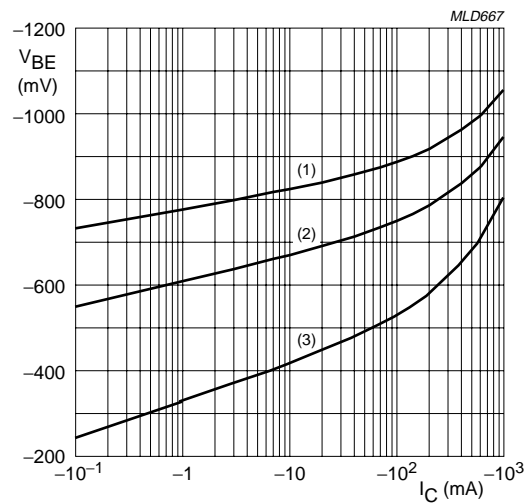
15 V, 0.5 A  
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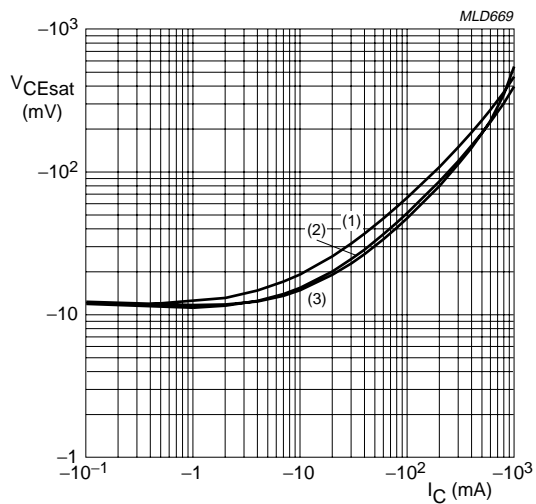
$V_{CE} = -2\text{ V}$ .  
(1)  $T_{amb} = 150^\circ\text{C}$ .  
(2)  $T_{amb} = 25^\circ\text{C}$ .  
(3)  $T_{amb} = -55^\circ\text{C}$ .

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



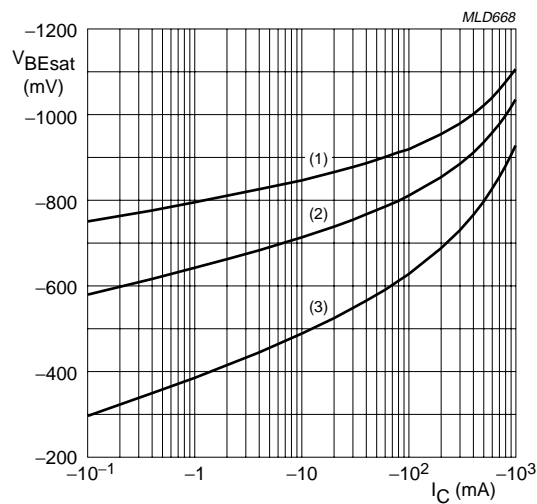
$V_{CE} = -2\text{ V}$ .  
(1)  $T_{amb} = -55^\circ\text{C}$ .  
(2)  $T_{amb} = 25^\circ\text{C}$ .  
(3)  $T_{amb} = 150^\circ\text{C}$ .

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



$I_C/I_B = 20$ .  
(1)  $T_{amb} = 150^\circ\text{C}$ .  
(2)  $T_{amb} = 25^\circ\text{C}$ .  
(3)  $T_{amb} = -55^\circ\text{C}$ .

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

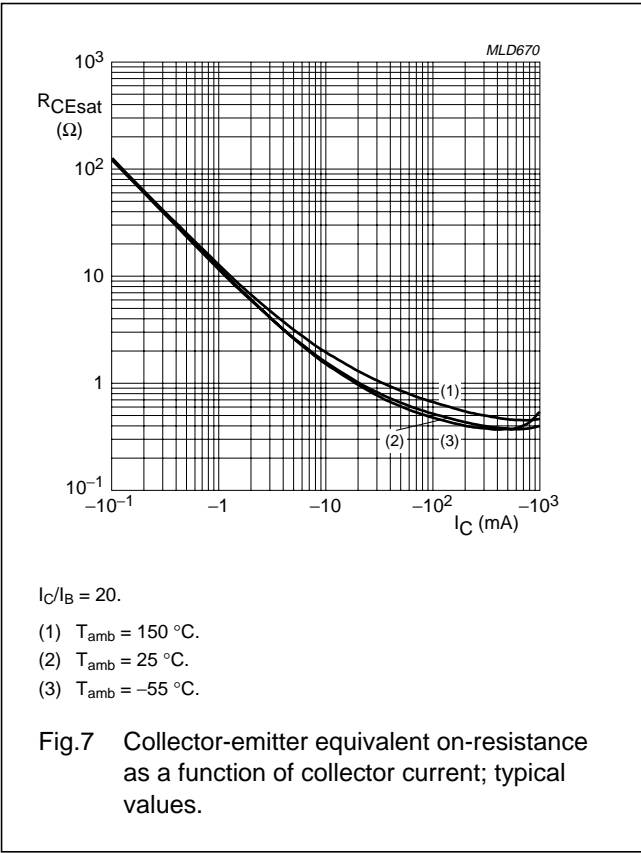
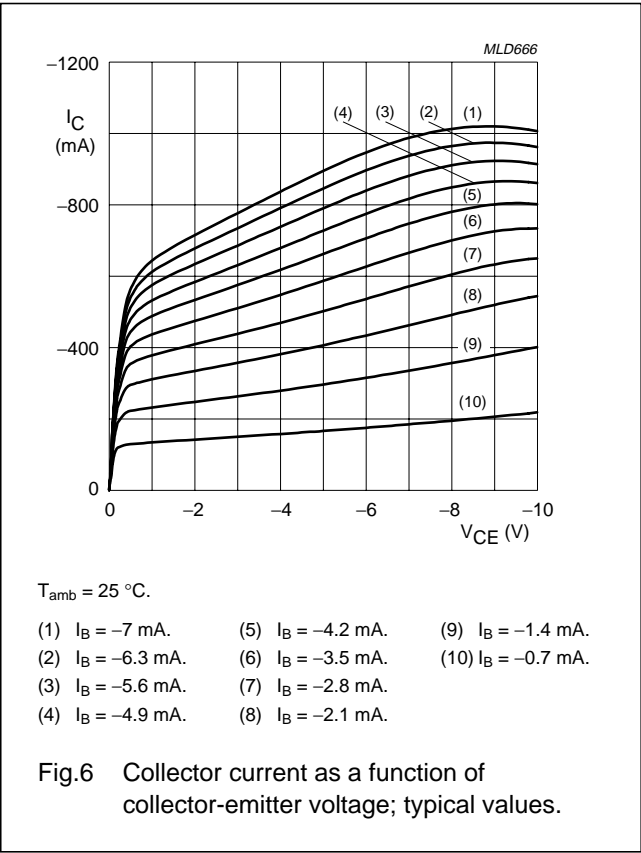


$I_C/I_B = 20$ .  
(1)  $T_{amb} = 150^\circ\text{C}$ .  
(2)  $T_{amb} = 25^\circ\text{C}$ .  
(3)  $T_{amb} = -55^\circ\text{C}$ .

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

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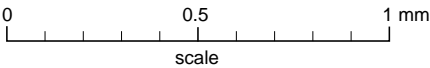
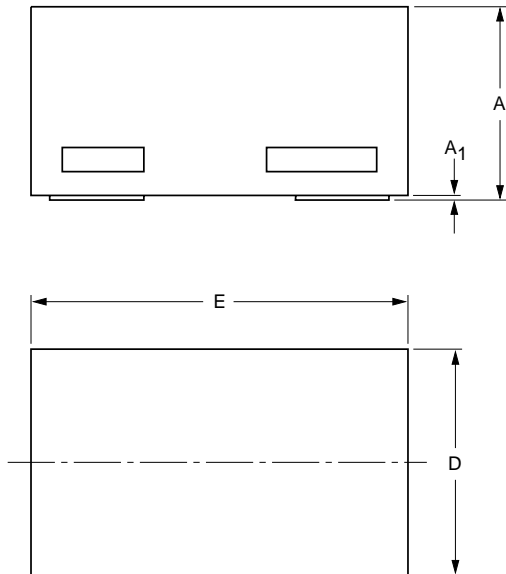
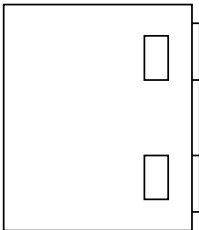
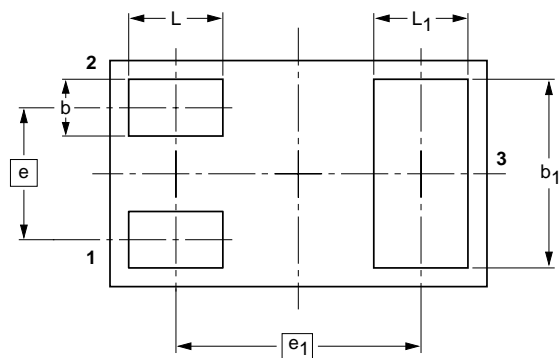
15 V, 0.5 A  
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PBSS3515M

PACKAGE OUTLINE

Leadless ultra small plastic package; 3 solder lands; body 1.0 x 0.6 x 0.5 mm

SOT883




DIMENSIONS (mm are the original dimensions)

UNIT	A <sup>(1)</sup>	A <sub>1</sub> max.	b	b <sub>1</sub>	D	E	e	e <sub>1</sub>	L	L <sub>1</sub>
mm	0.50 0.46	0.03	0.20 0.12	0.55 0.47	0.62 0.55	1.02 0.95	0.35	0.65	0.30 0.22	0.30 0.22

Note

1. Including plating thickness

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT883			SC-101			03-02-05 03-04-03

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