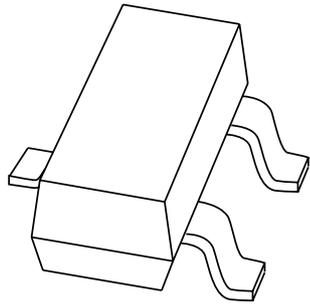


# DATA SHEET



**PBSS4320T**

20 V low  $V_{CEsat}$  NPN transistor

Product specification

2002 Aug 08

# 20 V low $V_{CEsat}$ NPN transistor

# PBSS4320T

### 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

NPN low  $V_{CEsat}$  transistor in a SOT23 plastic package.  
PNP complement: PBSS5320T.

### MARKING

TYPE NUMBER	MARKING CODE <sup>(1)</sup>
PBSS4320T	ZG*

### 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	20	V
$I_C$	collector current (DC)	2	A
$I_{CRP}$	repetitive peak collector current	3	A
$R_{CEsat}$	equivalent on-resistance	105	m $\Omega$

### PINNING

PIN	DESCRIPTION
1	base
2	emitter
3	collector

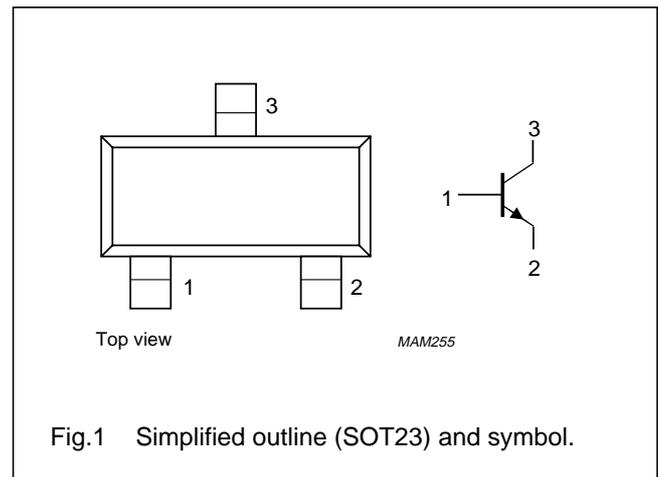


Fig.1 Simplified outline (SOT23) and symbol.

20 V low  $V_{CEsat}$  NPN transistor

## PBSS4320T

**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	–	20	V
$V_{CEO}$	collector-emitter voltage	open base	–	20	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	$T_{amb} \leq 25\text{ °C}$ ; note 2	–	300	mW
		$T_{amb} \leq 25\text{ °C}$ ; note 3	–	480	mW
		$T_{amb} \leq 25\text{ °C}$ ; note 4	–	540	mW
		$T_{amb} \leq 25\text{ °C}$ ; 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**

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

**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**

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

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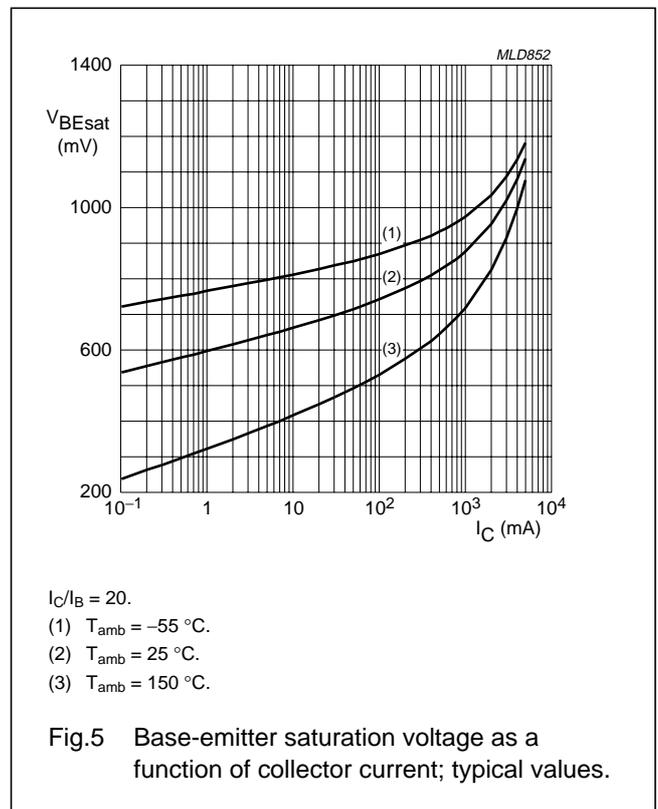
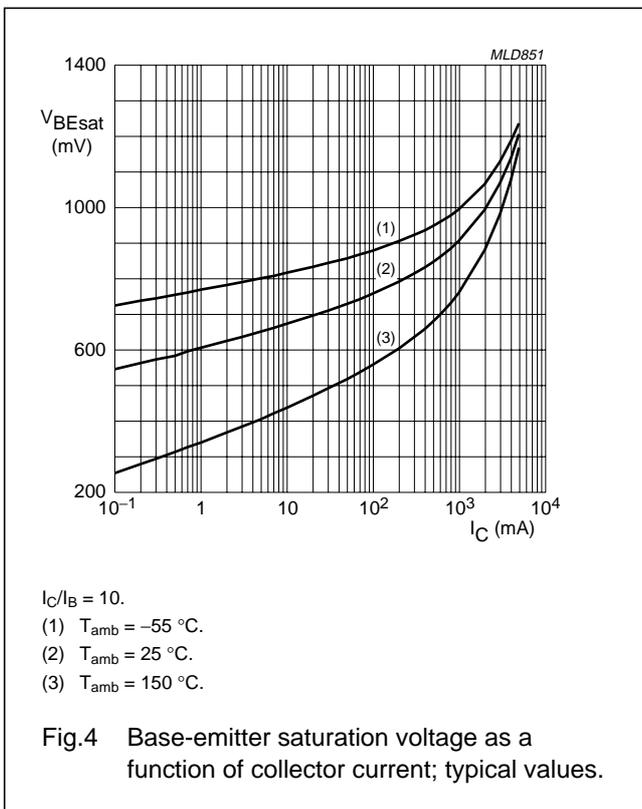
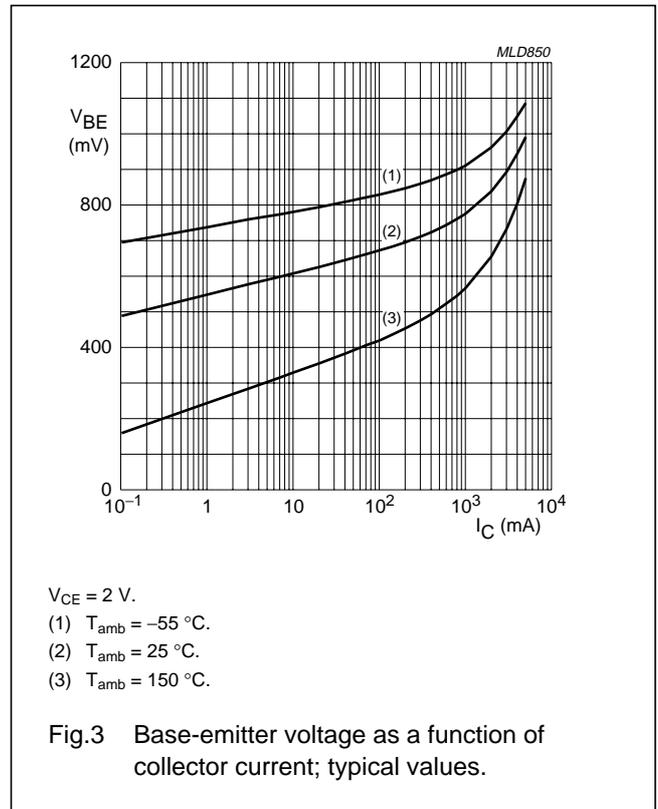
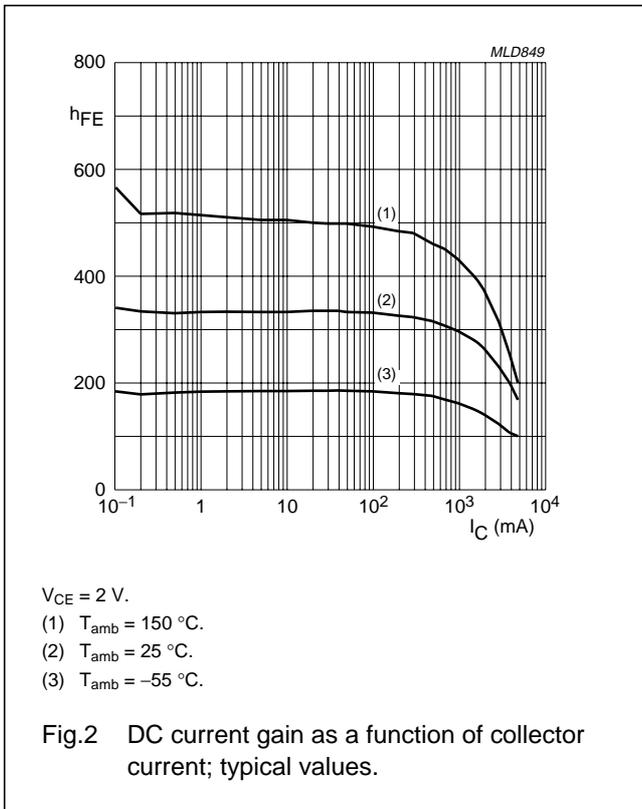
**CHARACTERISTICS** $T_{amb} = 25\text{ °C}$  unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$I_{CBO}$	collector-base cut-off current	$V_{CB} = 20\text{ V}; I_E = 0$	–	–	100	nA
		$V_{CB} = 20\text{ V}; I_E = 0; T_j = 150\text{ °C}$	–	–	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	$V_{CE} = 2\text{ V}; I_C = 100\text{ mA}$	220	–	–	
		$V_{CE} = 2\text{ V}; I_C = 500\text{ mA}$	220	–	–	
		$V_{CE} = 2\text{ V}; I_C = 1\text{ A};$ note 1	220	–	–	
		$V_{CE} = 2\text{ V}; I_C = 2\text{ A};$ note 1	200	–	–	
		$V_{CE} = 2\text{ V}; I_C = 3\text{ A};$ note 1	150	–	–	
$V_{CEsat}$	collector-emitter saturation voltage	$I_C = 500\text{ mA}; I_B = 50\text{ mA}$	–	–	70	mV
		$I_C = 1\text{ A}; I_B = 50\text{ mA}$	–	–	120	mV
		$I_C = 2\text{ A}; I_B = 40\text{ mA};$ note 1	–	–	230	mV
		$I_C = 2\text{ A}; I_B = 200\text{ mA};$ note 1	–	–	210	mV
		$I_C = 3\text{ A}; I_B = 300\text{ mA};$ note 1	–	–	310	mV
$R_{CEsat}$	equivalent on-resistance	$I_C = 2\text{ A}; I_B = 200\text{ mA};$ note 1	–	80	105	$\text{m}\Omega$
$V_{BEsat}$	base-emitter saturation voltage	$I_C = 2\text{ A}; I_B = 40\text{ mA};$ note 1	–	–	1.1	V
		$I_C = 3\text{ A}; I_B = 300\text{ mA};$ note 1	–	–	1.2	V
$V_{BEon}$	base-emitter turn-on voltage	$V_{CE} = 2\text{ V}; I_C = 1\text{ A};$ note 1	1.2	–	–	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	$V_{CB} = 10\text{ V}; I_E = I_e = 0; f = 1\text{ MHz}$	–	–	35	pF

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

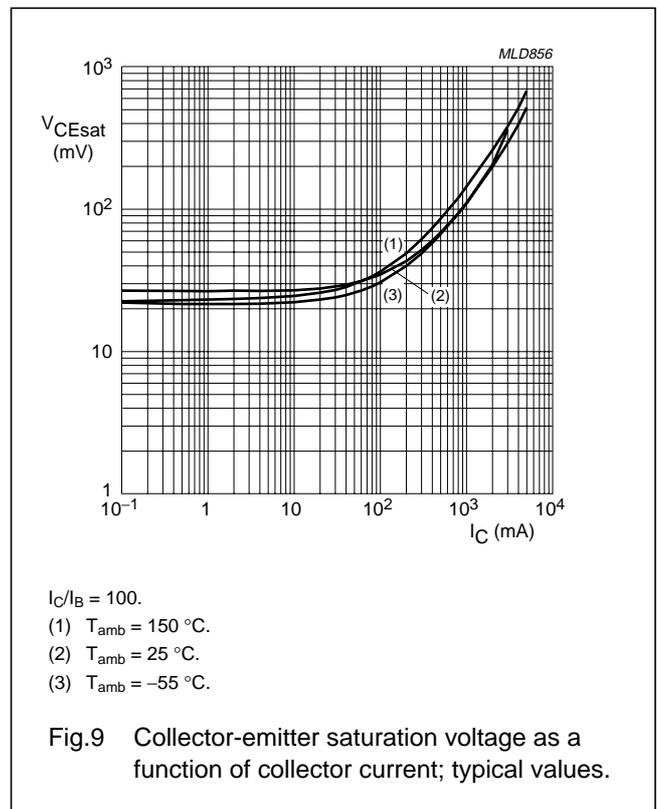
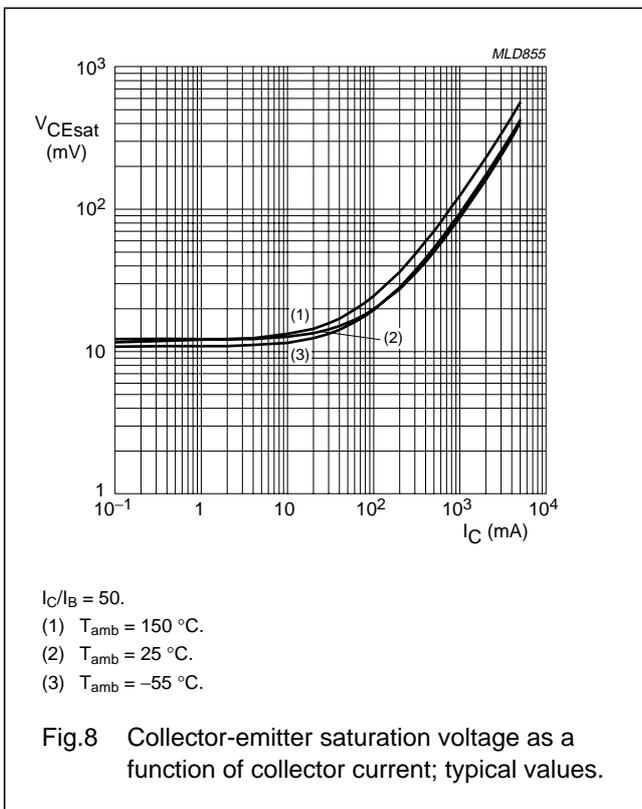
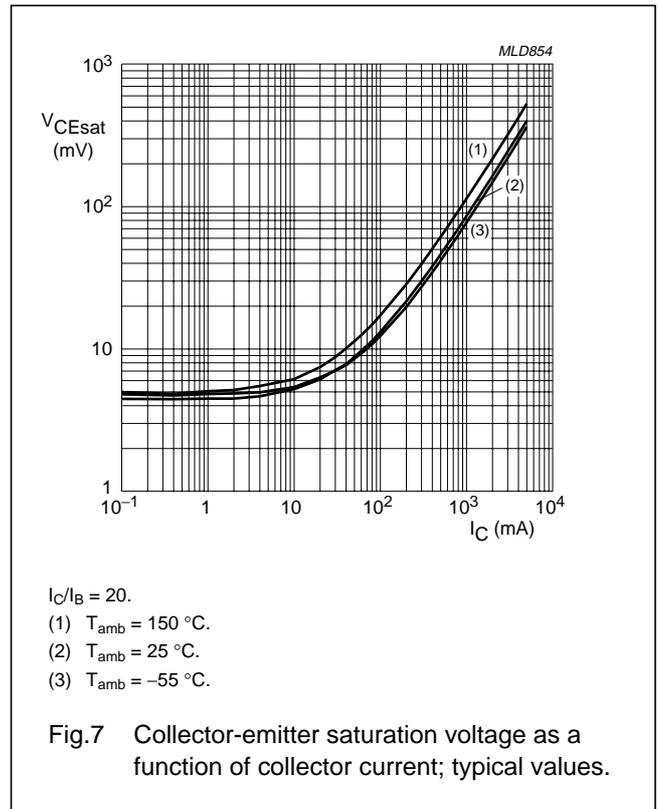
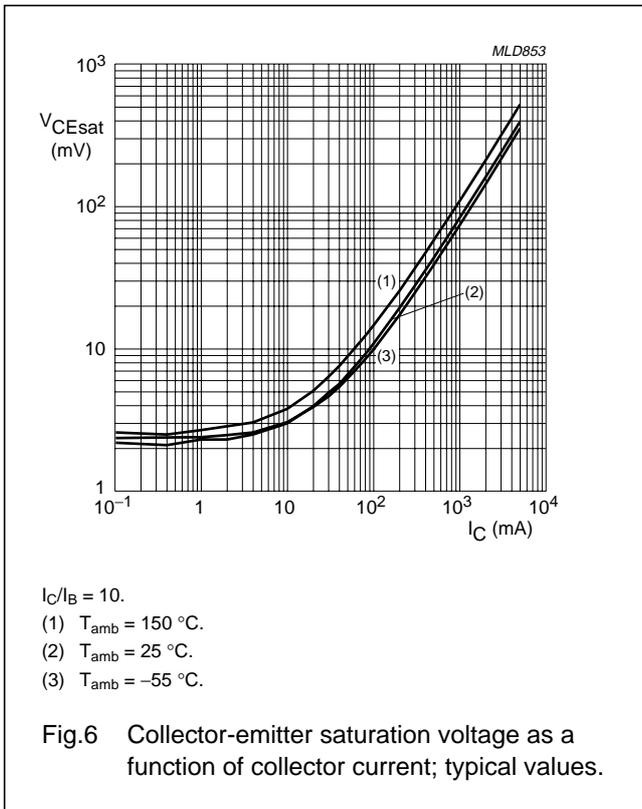
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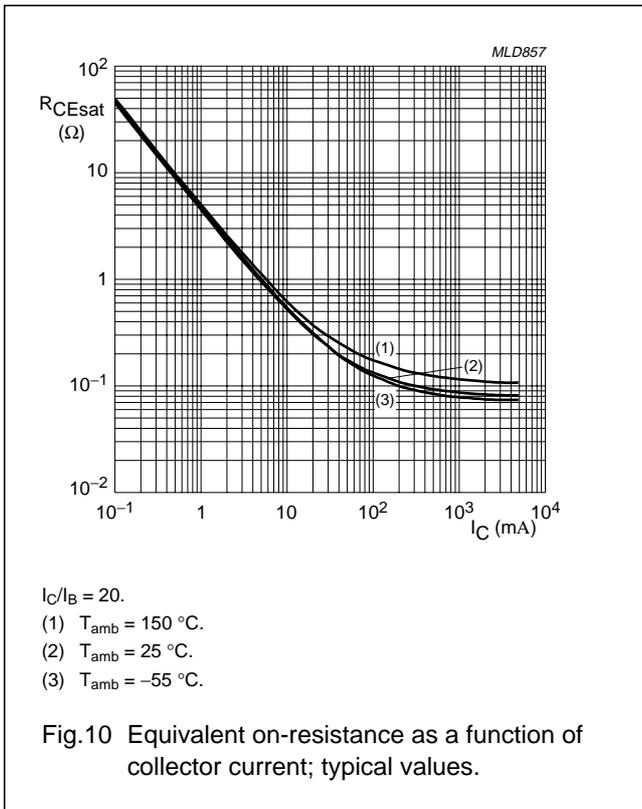
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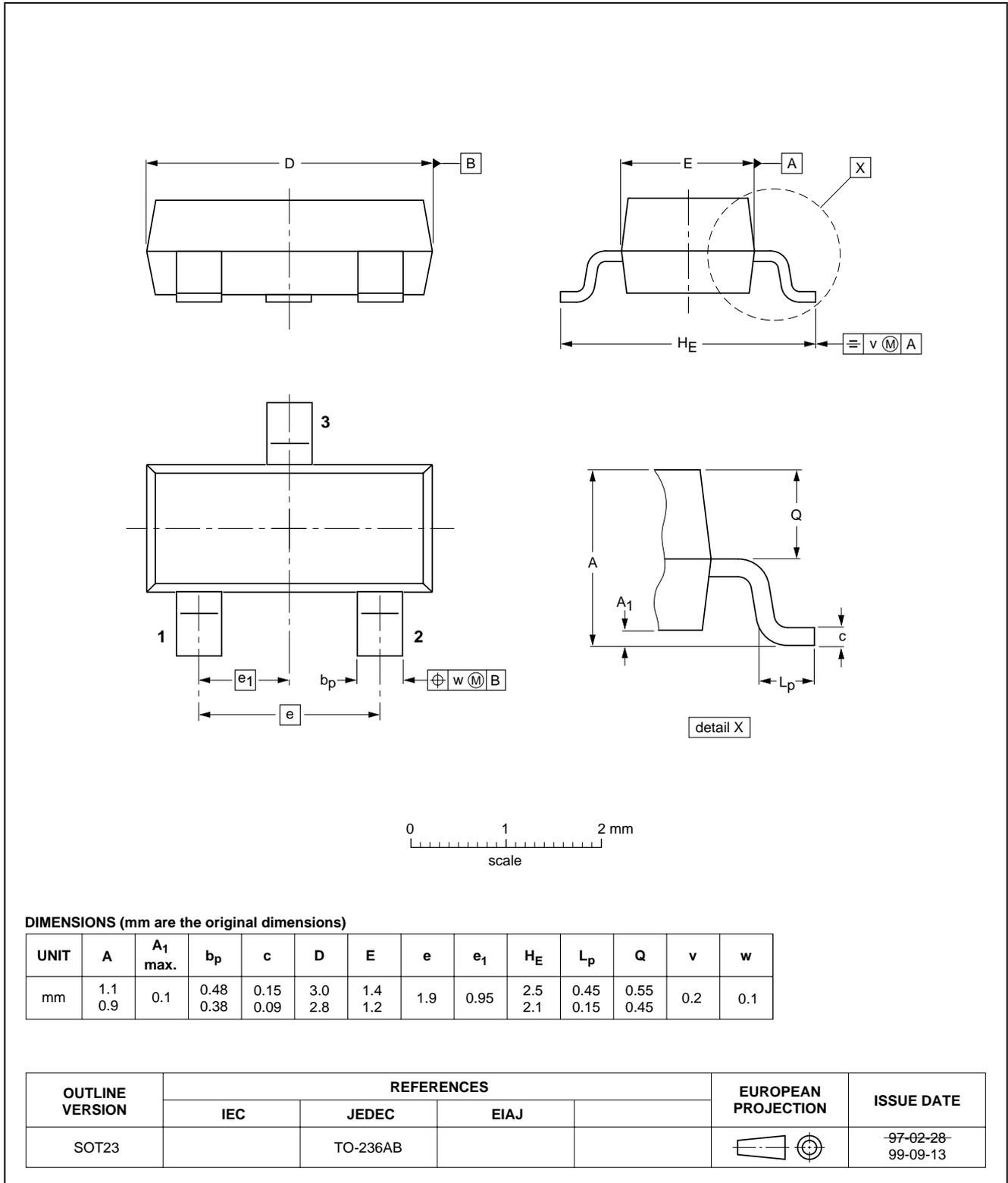
20 V low  $V_{CEsat}$  NPN transistor

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PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT23



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## DATA SHEET STATUS

DATA SHEET STATUS <sup>(1)</sup>	PRODUCT STATUS <sup>(2)</sup>	DEFINITIONS
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**NOTES**

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**NOTES**

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