

# DATA SHEET



**PBSS5320T**

20 V, 3 A

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

Product specification  
Supersedes data of 2002 Aug 08

2004 Jan 15

**20 V, 3 A**  
**PNP low  $V_{CEsat}$  (BISS) transistor**

**PBSS5320T**

**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: PBSS4320T.

**MARKING**

TYPE NUMBER	MARKING CODE <sup>(1)</sup>
PBSS5320T	ZH*

**Note**

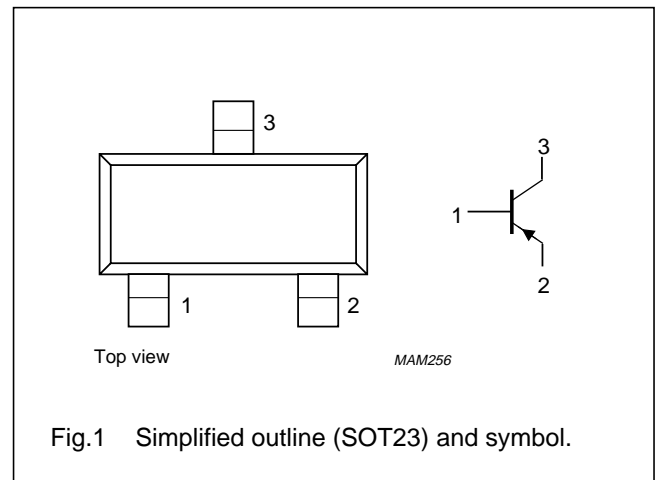
- \* = p: Made in Hong Kong.  
 \* = t: Made in Malaysia.  
 \* = W: Made in China.

**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



**ORDERING INFORMATION**

TYPE NUMBER	PACKAGE		
	NAME	DESCRIPTION	VERSION
PBSS5320T	-	plastic surface mounted package; 3 leads	SOT23

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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	–	–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; tin plated; standard footprint.
- Device mounted on a printed-circuit board; single sided copper; tin plated; mounting pad for collector  $1\text{ cm}^2$ .
- Device mounted on a printed-circuit board; single sided copper; tin plated; 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; tin plated; standard footprint.
- Device mounted on a printed-circuit board; single sided copper; tin plated; mounting pad for collector  $1\text{ cm}^2$ .
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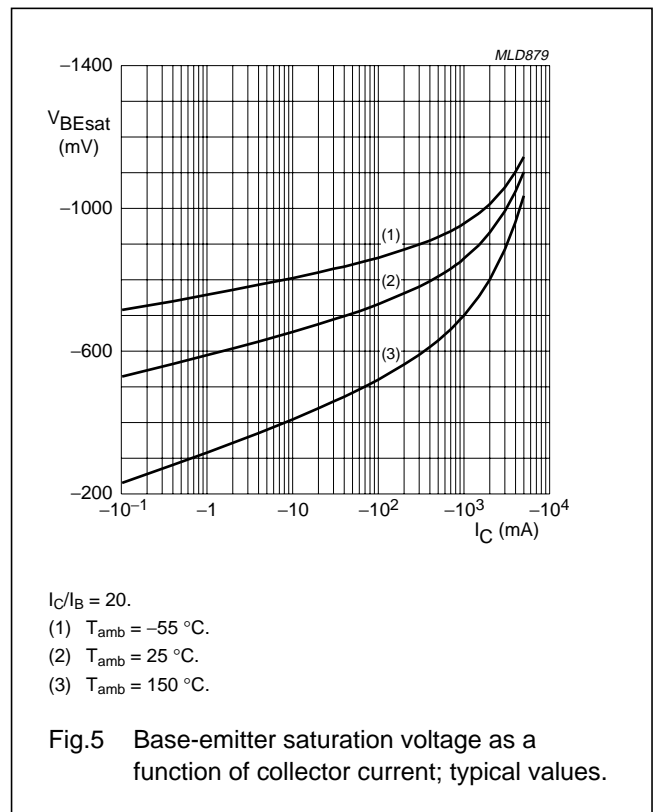
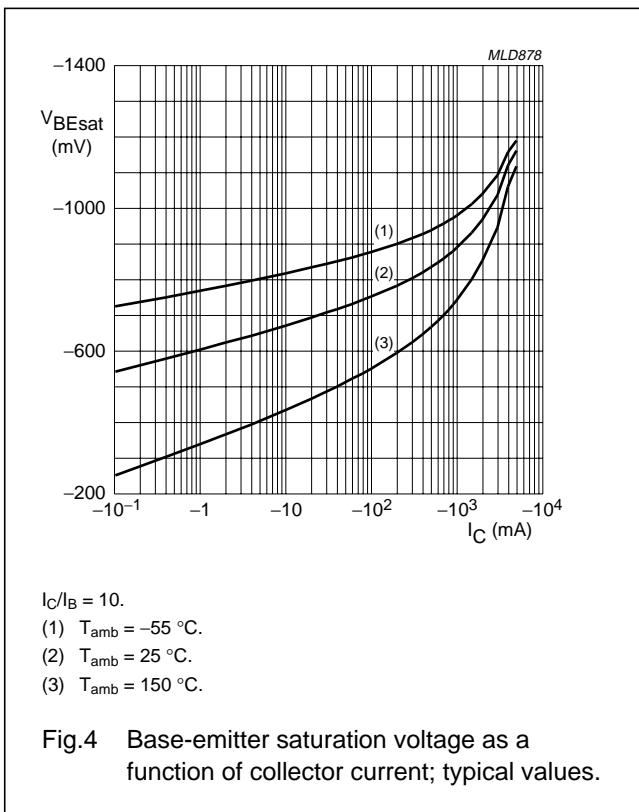
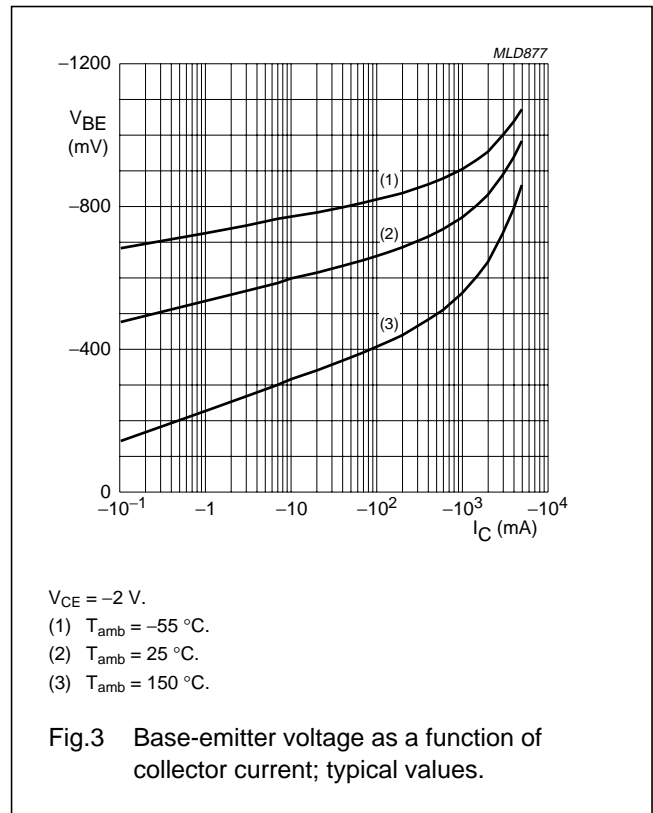
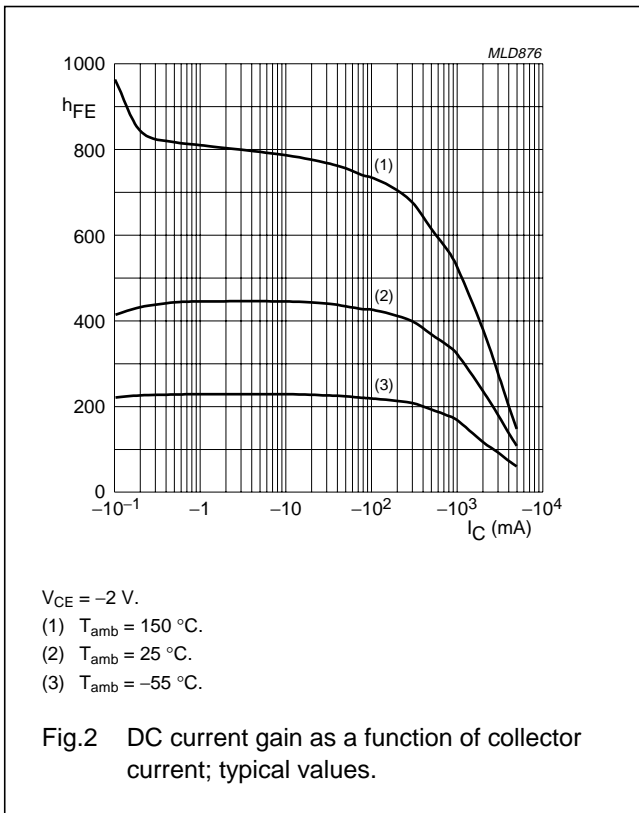
**CHARACTERISTICS** $T_{amb} = 25\text{ °C}$  unless otherwise specified.

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	200	–	–	
		$V_{CE} = -2\text{ V}; I_C = -2\text{ A};$ note 1	150	–	–	
		$V_{CE} = -2\text{ V}; I_C = -3\text{ A};$ note 1	100	–	–	
$V_{CEsat}$	collector-emitter saturation voltage	$I_C = -500\text{ mA}; I_B = -50\text{ mA}$	–	–	–70	mV
		$I_C = -1\text{ A}; I_B = -50\text{ mA}$	–	–	–130	mV
		$I_C = -2\text{ A}; I_B = -100\text{ mA};$ 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	–	–	–300	mV
$R_{CEsat}$	equivalent on-resistance	$I_C = -2\text{ A}; I_B = -200\text{ mA};$ note 1	–	75	105	$\text{m}\Omega$
$V_{BEsat}$	base-emitter saturation voltage	$I_C = -2\text{ A}; I_B = -100\text{ mA};$ note 1	–	–	–1.1	V
		$I_C = -3\text{ A}; I_B = -300\text{ mA};$ note 1	–	–	–1.2	V
$V_{BE(on)}$	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	$V_{CB} = -10\text{ V}; I_E = I_e = 0; f = 1\text{ MHz}$	–	–	50	pF

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

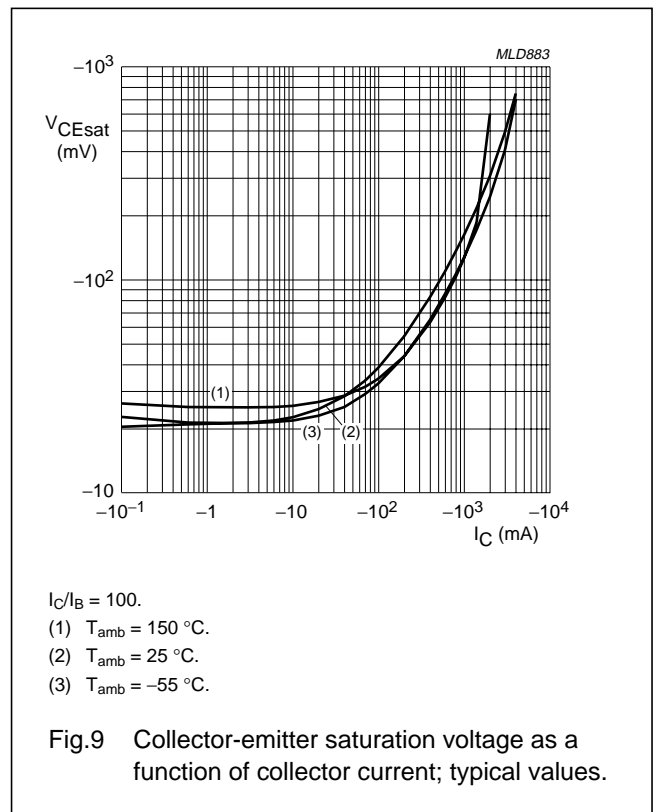
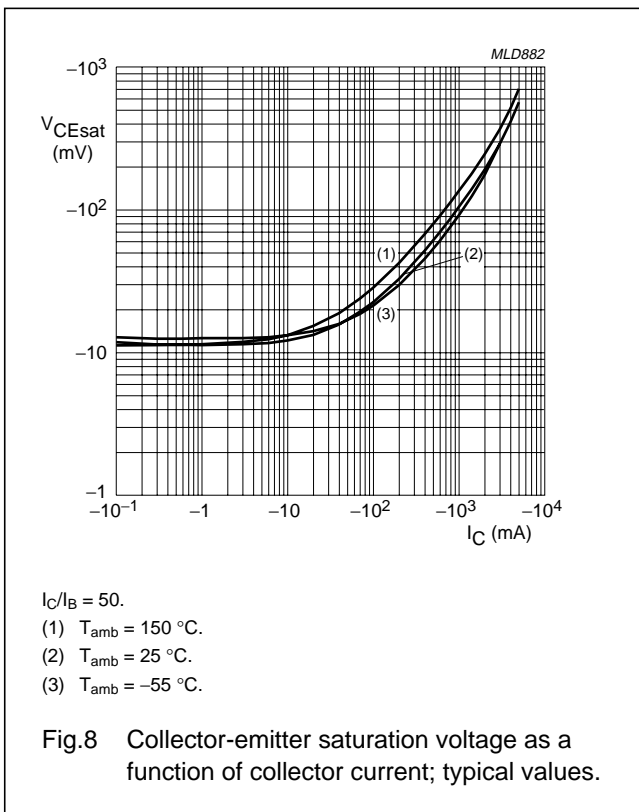
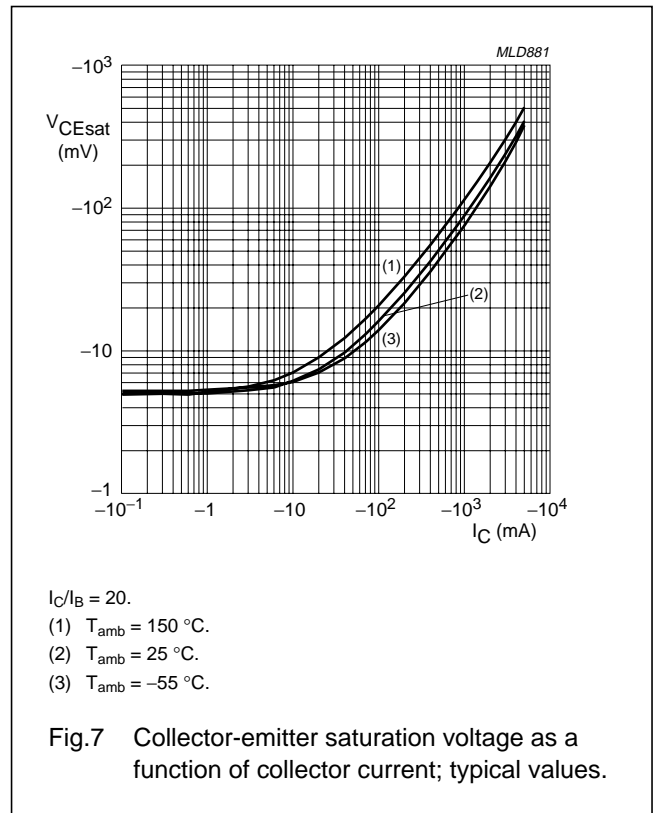
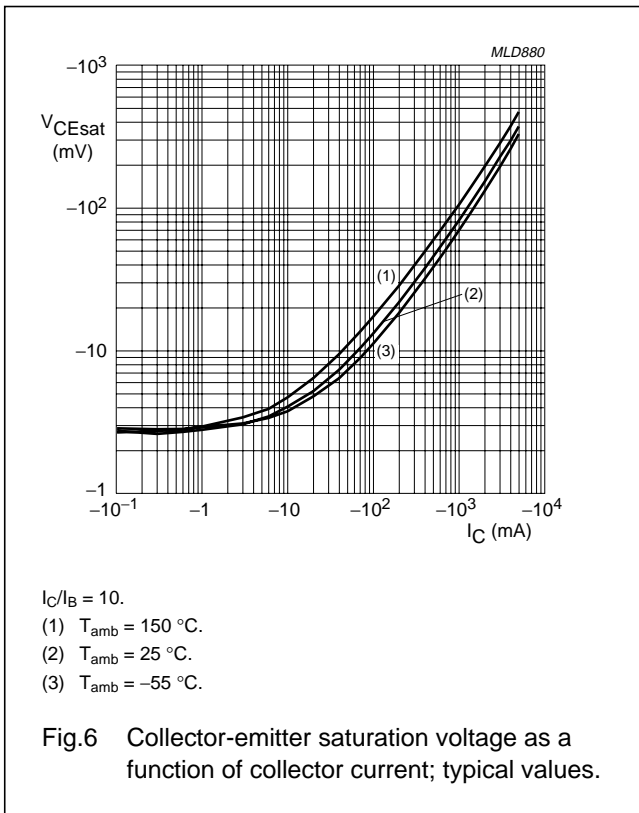
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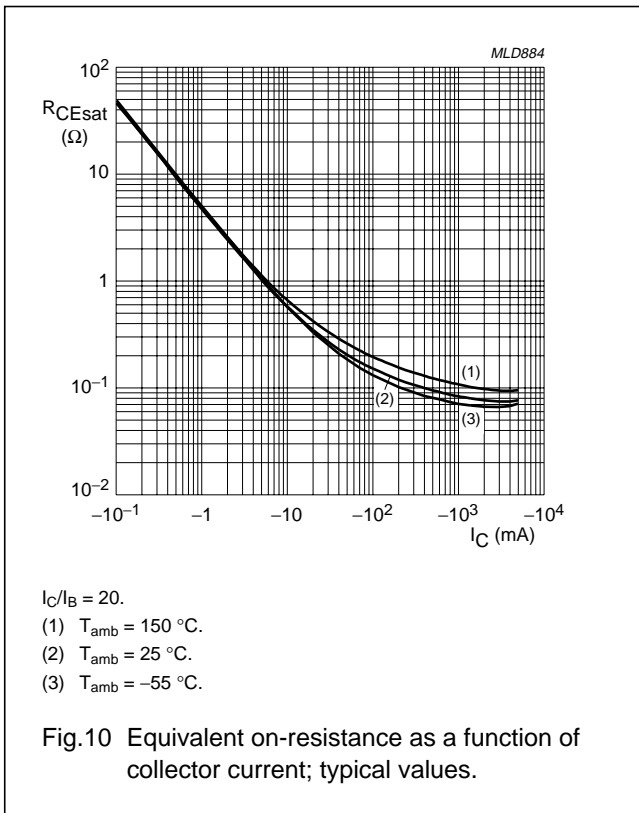
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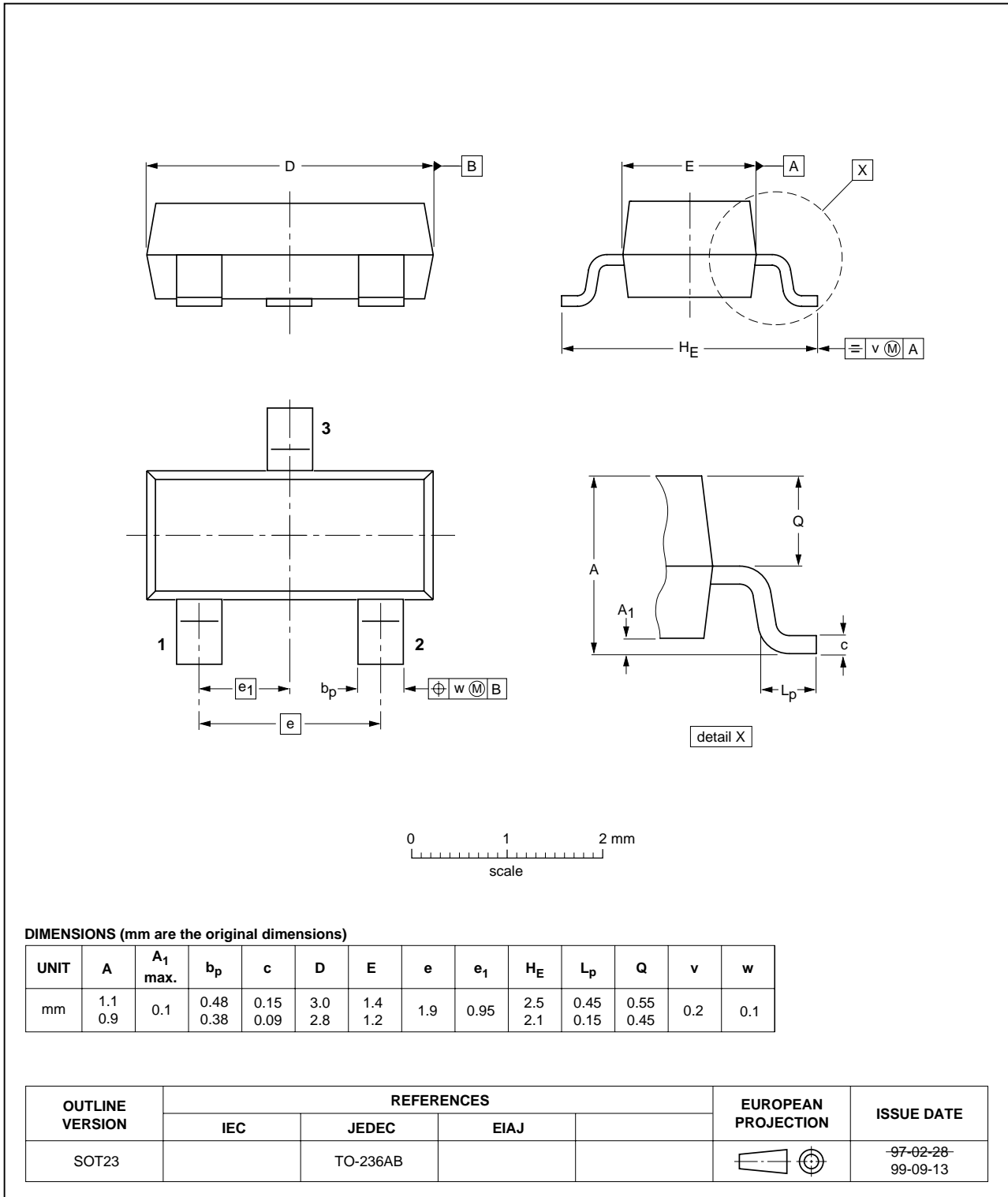
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PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT23





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#### DATA SHEET STATUS

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