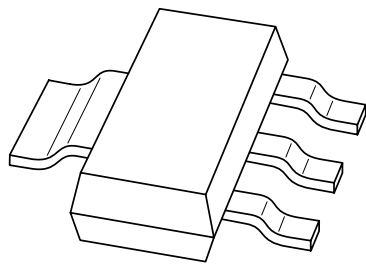


# DATA SHEET



**PBSS4540Z**

**40 V low  $V_{CEsat}$  NPN transistor**

Product specification  
Supersedes data of 2001 Jul 24

2001 Nov 14

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

# PBSS4540Z

### FEATURES

- Low collector-emitter saturation voltage
- High current capabilities
- Improved device reliability due to reduced heat generation.

### APPLICATIONS

- Supply line switching circuits
- Battery management applications
- DC/DC converter applications
- Strobe flash units
- Heavy duty battery powered equipment (motor and lamp drivers)
- MOSFET driver applications.

### DESCRIPTION

NPN low  $V_{CEsat}$  transistor in a SOT223 plastic package.  
PNP complement: PBSS5540Z.

### MARKING

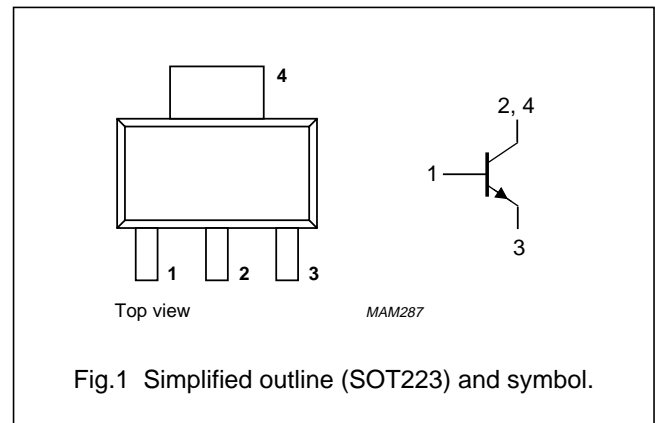
TYPE NUMBER	MARKING CODE
PBSS4540Z	PB4540

### QUICK REFERENCE DATA

SYMBOL	PARAMETER	MAX	UNIT
$V_{CEO}$	emitter-collector voltage	40	V
$I_C$	collector current (DC)	5	A
$I_{CM}$	peak collector current	10	A
$R_{CEsat}$	equivalent on-resistance	<71	m $\Omega$

### PINNING

PIN	DESCRIPTION
1	base
2	collector
3	emitter
4	collector



40 V low  $V_{CEsat}$  NPN transistor

PBSS4540Z

**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	$T_{amb} \leq 25\text{ °C}$ ; notes 1 and 3	–	1.35	W
		$T_{amb} \leq 25\text{ °C}$ ; 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, tinned, mounting pad for collector 1 cm<sup>2</sup>.
2. Device mounted on a printed-circuit board, single-sided copper, tinned, mounting pad for collector 6 cm<sup>2</sup>.
3. For other mounting conditions, see “*Thermal considerations for SOT223 in the General Part of associated Handbook*”.

**THERMAL CHARACTERISTICS**

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-a}$	thermal resistance from junction to ambient	note 1	92	K/W
		note 2	62.5	K/W

**Notes**

1. Device mounted on a printed-circuit board, single-sided copper, tinned, mounting pad for collector 1 cm<sup>2</sup>.
2. Device mounted on a printed-circuit board, single-sided copper, tinned, mounting pad for collector 6 cm<sup>2</sup>.

40 V low  $V_{CEsat}$  NPN transistor

## PBSS4540Z

**CHARACTERISTICS**

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

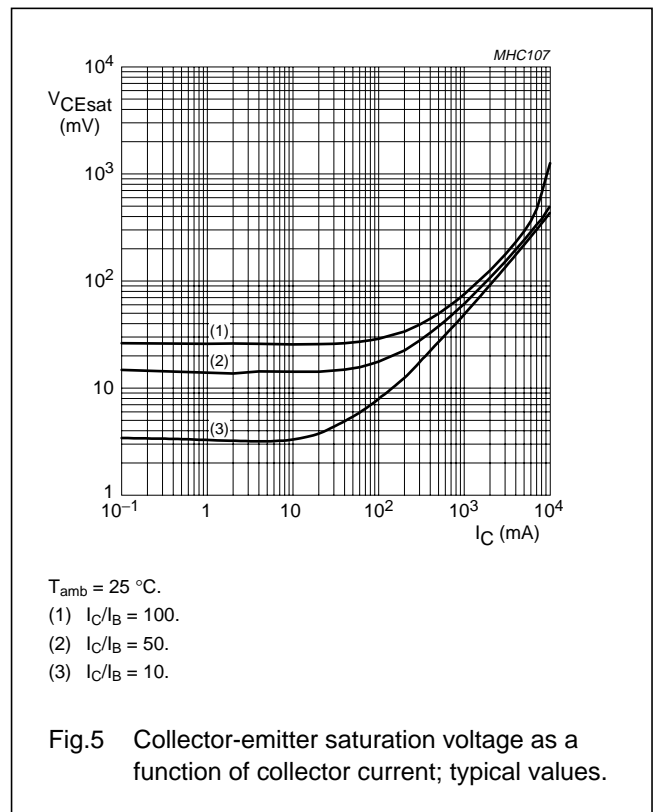
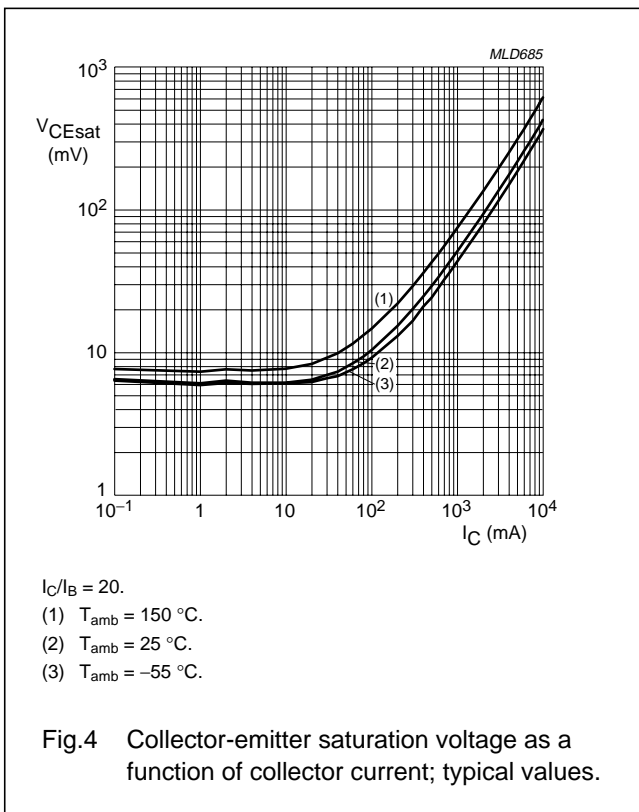
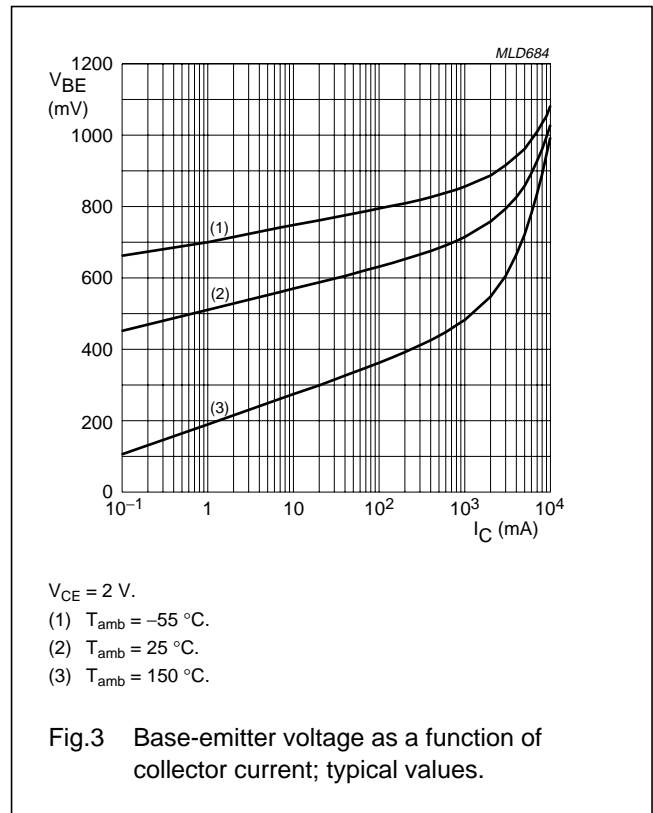
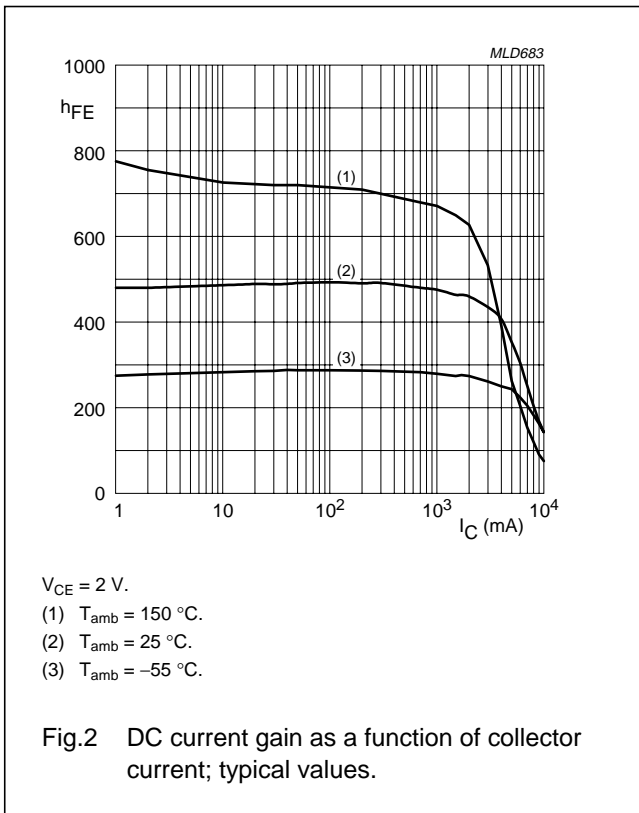
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$I_{CBO}$	collector-base cut-off current	$V_{CB} = 30\text{ V}; I_E = 0$	–	–	100	nA
		$V_{CB} = 30\text{ V}; I_E = 0; T_j = 150\text{ °C}$	–	–	50	$\mu\text{A}$
$I_{EBO}$	emitter-base cut-off current	$V_{EB} = 5\text{ V}; I_C = 0$	–	–	100	nA
$h_{FE}$	DC current gain	$V_{CE} = 2\text{ V}; I_C = 500\text{ mA}$	300	500	–	
		$V_{CE} = 2\text{ V}; I_C = 1\text{ A}; \text{note 1}$	300	500	–	
		$V_{CE} = 2\text{ V}; I_C = 2\text{ A}; \text{note 1}$	250	450	–	
		$V_{CE} = 2\text{ V}; I_C = 5\text{ A}; \text{note 1}$	100	300	–	
$V_{CEsat}$	collector-emitter saturation voltage	$I_C = 500\text{ mA}; I_B = 5\text{ mA}$	–	50	90	mV
		$I_C = 1\text{ A}; I_B = 10\text{ mA}$	–	75	120	mV
		$I_C = 2\text{ A}; I_B = 200\text{ mA}$	–	90	150	mV
		$I_C = 5\text{ A}; I_B = 500\text{ mA}$	–	210	355	mV
$R_{CEsat}$	equivalent on-resistance	$I_C = 5\text{ A}; I_B = 500\text{ mA}; \text{note 1}$	–	42	71	$\text{m}\Omega$
$V_{BEsat}$	base-emitter saturation voltage	$I_C = 5\text{ A}; I_B = 500\text{ mA}$	–	1.1	1.3	V
$V_{BEon}$	base-emitter turn-on voltage	$V_{CE} = 2\text{ V}; I_C = 2\text{ A}$	–	0.8	1.1	V
$f_T$	transition frequency	$I_C = 100\text{ mA}; V_{CE} = 10\text{ V}; f = 100\text{ MHz}$	70	130	–	MHz
$C_c$	collector capacitance	$V_{CB} = 10\text{ V}; I_E = I_e = 0; f = 1\text{ MHz}$	–	60	75	pF

**Note**

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

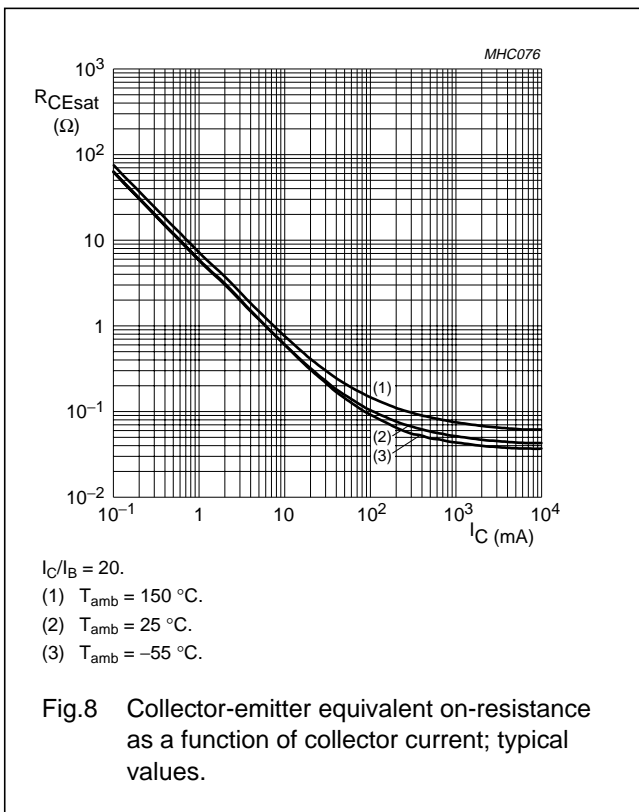
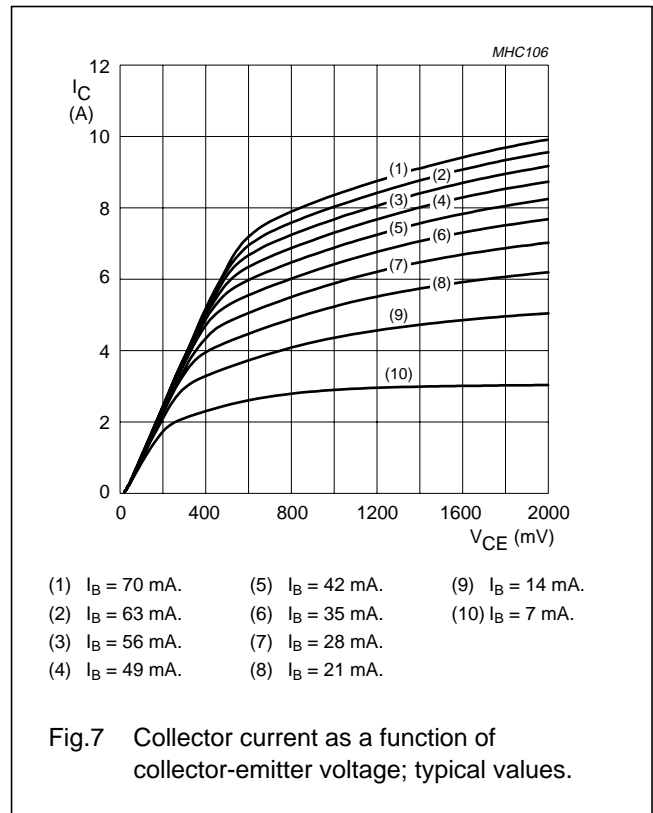
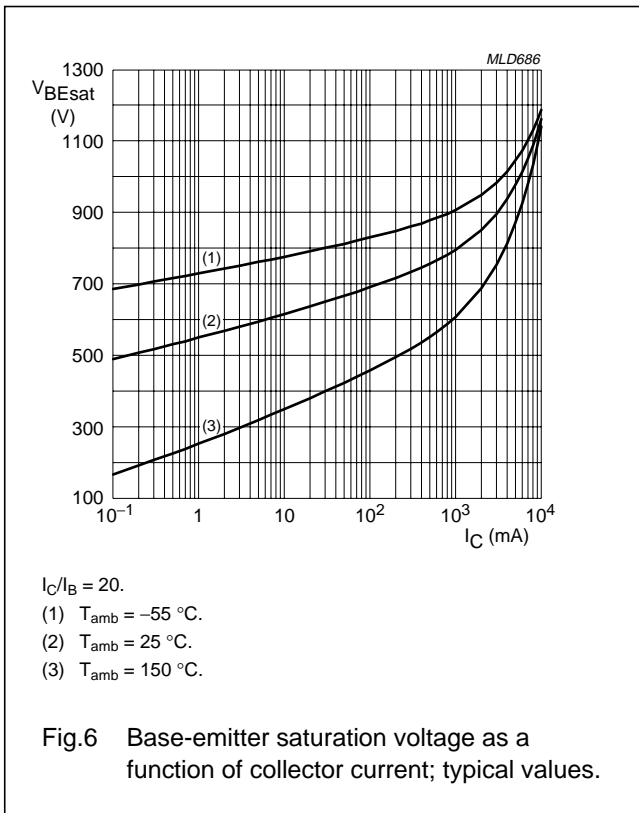
40 V low  $V_{CEsat}$  NPN transistor

PBSS4540Z



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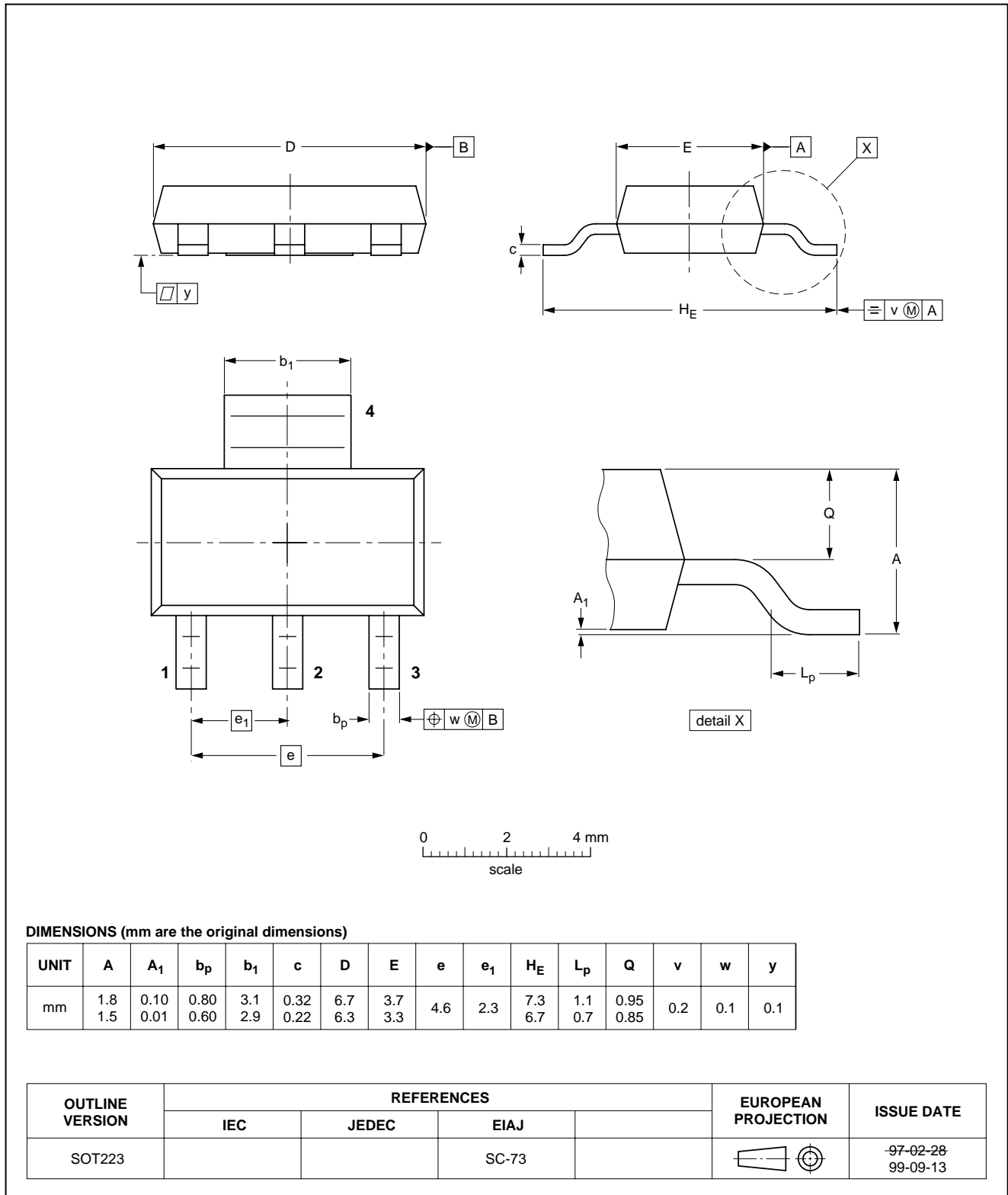
40 V low  $V_{CEsat}$  NPN transistor

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PACKAGE OUTLINE

Plastic surface mounted package; collector pad for good heat transfer; 4 leads

SOT223



40 V low  $V_{CEsat}$  NPN transistor

PBSS4540Z

## 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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**NOTES**

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