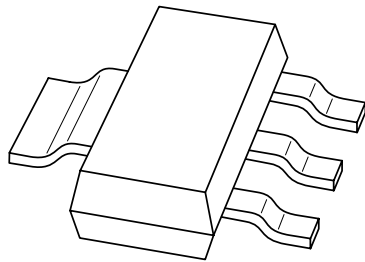


# DATA SHEET



**PBSS4540Z**

40 V low  $V_{CEsat}$  NPN transistor

Product data sheet  
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

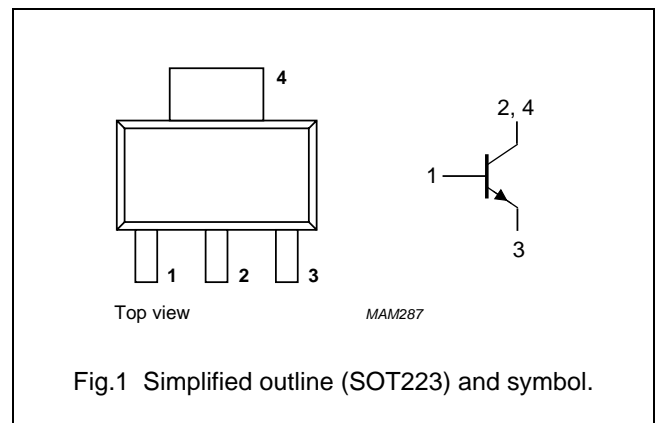
TYPE NUMBER	MARKING CODE
PBSS4540Z	PB4540

### 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



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

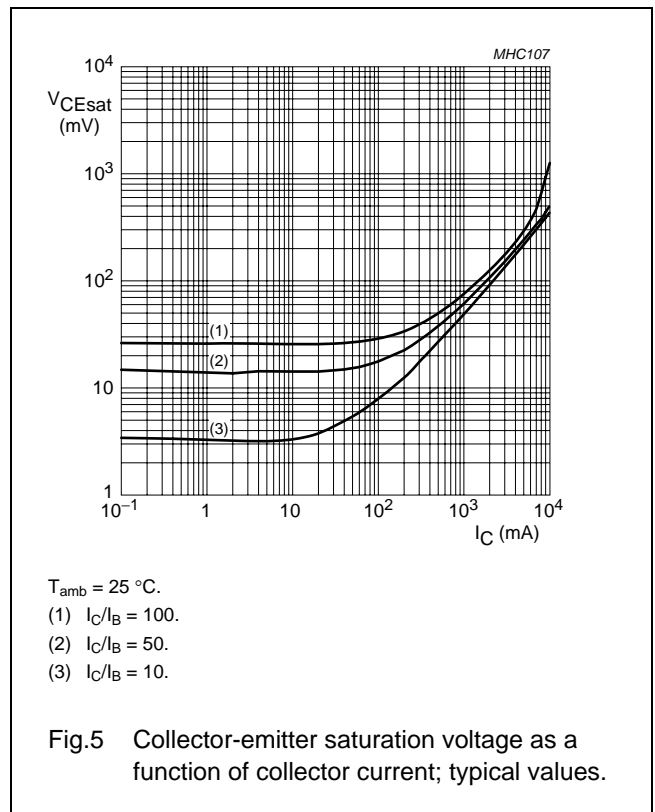
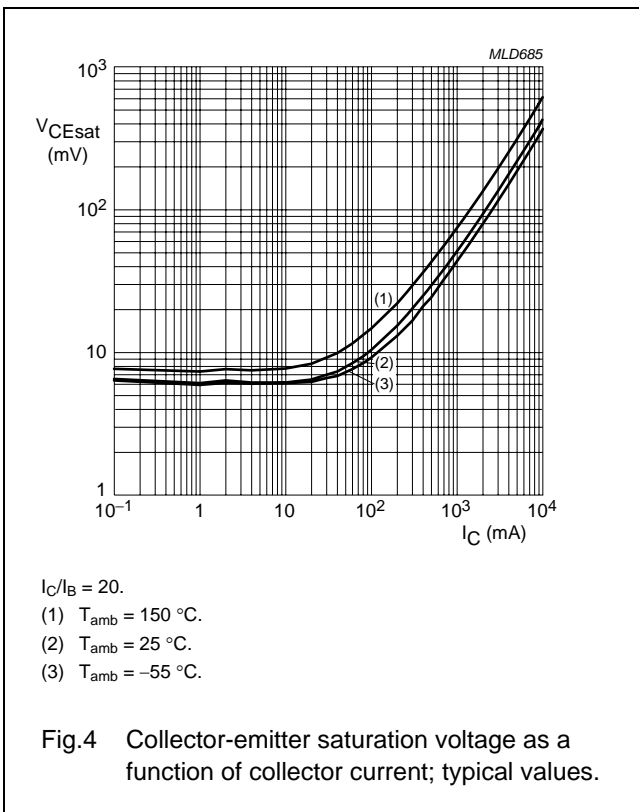
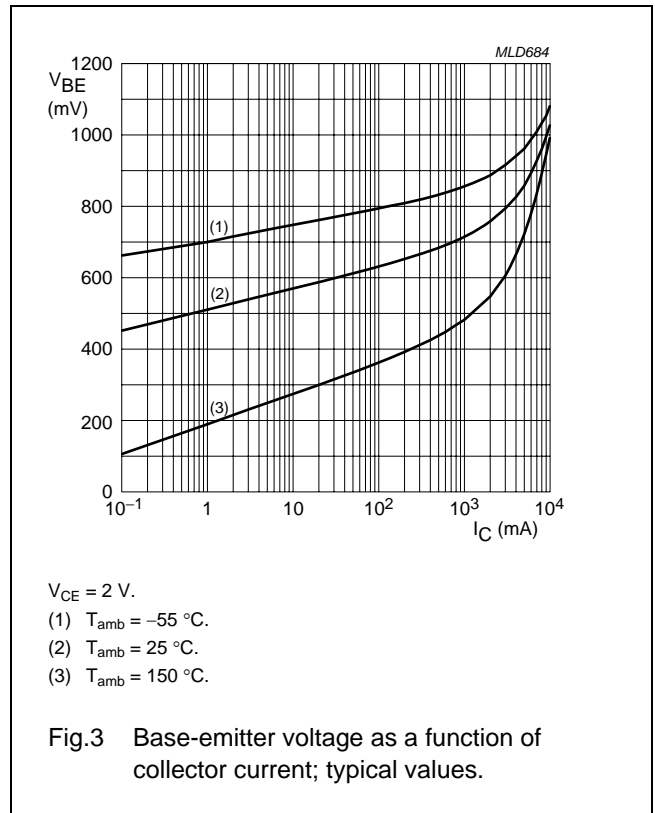
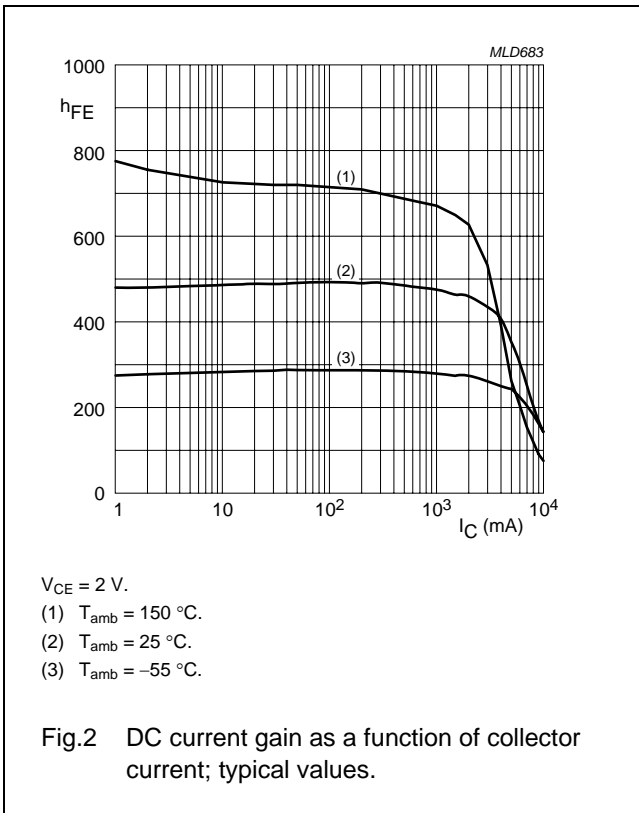
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$I_{CBO}$	collector-base cut-off current	$V_{CB} = 30\text{ V}; I_E = 0$	–	–	100	nA
		$V_{CB} = 30\text{ V}; I_E = 0; T_j = 150\text{ °C}$	–	–	50	$\mu\text{A}$
$I_{EBO}$	emitter-base cut-off current	$V_{EB} = 5\text{ V}; I_C = 0$	–	–	100	nA
$h_{FE}$	DC 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:  $t_p \leq 300\text{ }\mu\text{s}; \delta \leq 0.02$ .

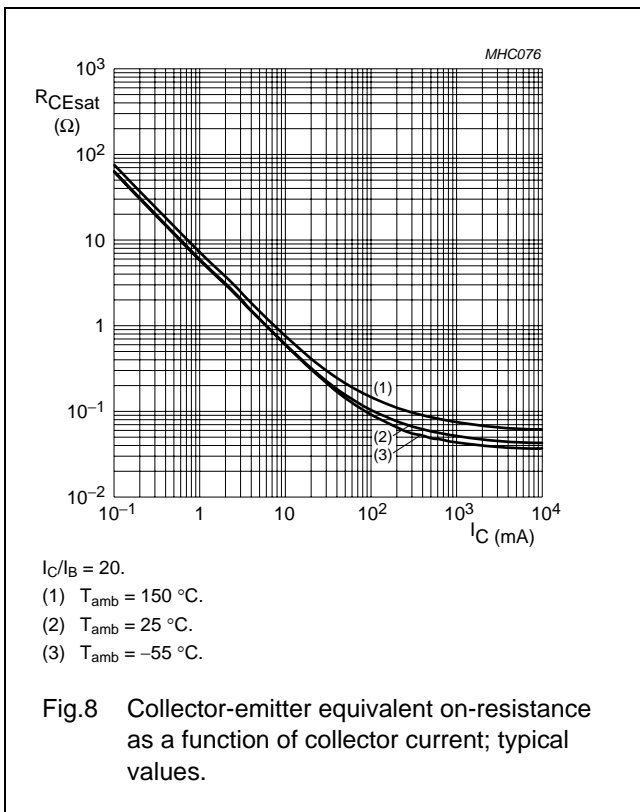
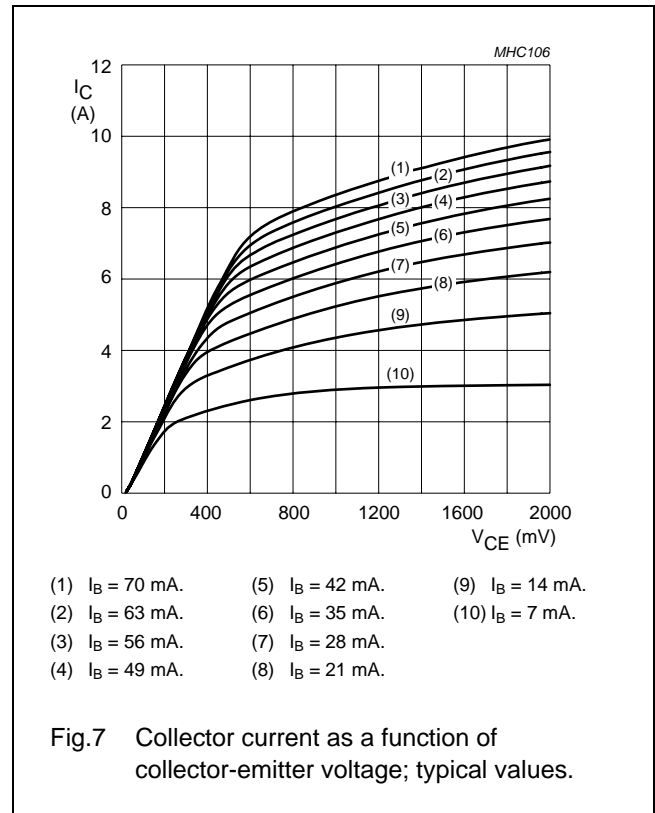
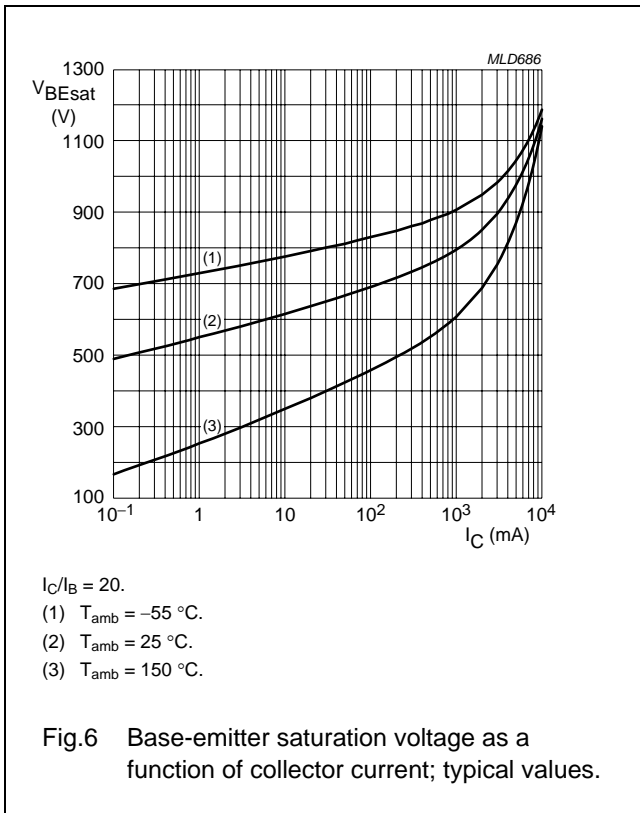
40 V low  $V_{CEsat}$  NPN transistor

PBSS4540Z



40 V low  $V_{CEsat}$  NPN transistor

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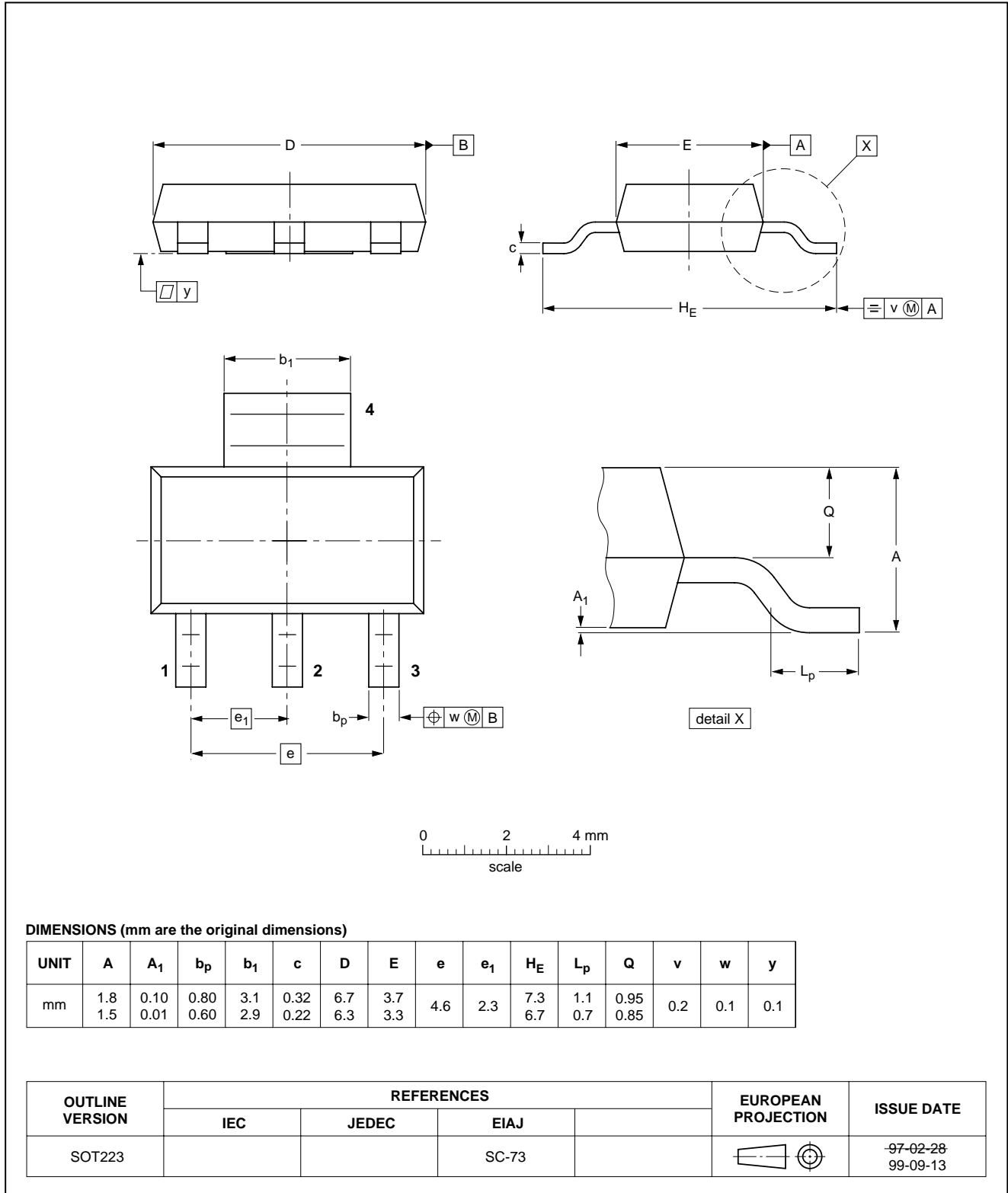
40 V low  $V_{CEsat}$  NPN transistor

PBSS4540Z

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

DOCUMENT STATUS <sup>(1)</sup>	PRODUCT STATUS <sup>(2)</sup>	DEFINITION
Objective data sheet	Development	This document contains data from the objective specification for product development.
Preliminary data sheet	Qualification	This document contains data from the preliminary specification.
Product data sheet	Production	This document contains the product specification.

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