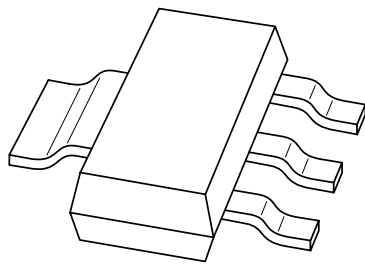


DATA SHEET



PBSS5540Z

40 V low V_{CEsat} PNP transistor

Product data sheet
Supersedes data of 2001 Jan 26

2001 Sep 21

40 V low V_{CEsat} PNP transistor

PBSS5540Z

FEATURES

- Low collector-emitter saturation voltage
- High current capability
- 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

PNP low V_{CEsat} transistor in a SOT223 plastic package.
NPN complement: PBSS4540Z.

MARKING

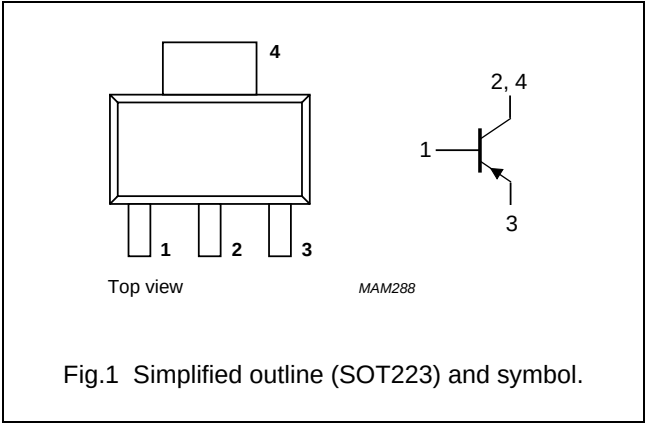
TYPE NUMBER	MARKING CODE
PBSS5540Z	PB5540

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	<80	m Ω

PINNING

PIN	DESCRIPTION
1	base
2	collector
3	emitter
4	collector



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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	–	–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	$T_{amb} \leq 25\text{ °C}$; note 1	–	1.35	W
		$T_{amb} \leq 25\text{ °C}$; note 2	–	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 cm².
2. Device mounted on a printed-circuit board, single-sided copper, tinplated, mounting pad for collector 6 cm².
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	in free air; note 1	92	K/W

Note

1. Device mounted on a printed-circuit board, single-sided copper, tinplated, mounting pad for collector 1 cm².

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CHARACTERISTICS

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

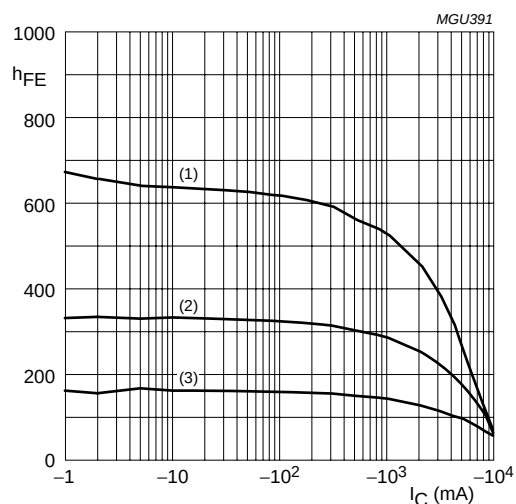
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_{CBO}	collector-base cut-off current	$V_{CB} = -30\text{ V}; I_E = 0$	–	–	–100	nA
		$V_{CB} = -30\text{ V}; I_E = 0; T_J = 150\text{ }^{\circ}\text{C}$	–	–	–50	μA
I_{EBO}	emitter-base cut-off current	$V_{EB} = -5\text{ V}; I_C = 0$	–	–	–100	nA
h_{FE}	DC current gain	$V_{CE} = -2\text{ V}; I_C = -500\text{ mA}$	250	350	–	
		$V_{CE} = -2\text{ V}; I_C = -1\text{ A}; \text{note 1}$	200	300	–	
		$V_{CE} = -2\text{ V}; I_C = -2\text{ A}; \text{note 1}$	150	250	–	
		$V_{CE} = -2\text{ V}; I_C = -5\text{ A}; \text{note 1}$	50	150	–	
V_{CEsat}	collector-emitter saturation voltage	$I_C = -500\text{ mA}; I_B = -5\text{ mA}$	–	–80	–120	mV
		$I_C = -1\text{ A}; I_B = -10\text{ mA}$	–	–120	–170	mV
		$I_C = -2\text{ A}; I_B = -200\text{ mA}$	–	–110	–160	mV
R_{CEsat}	equivalent on-resistance	$I_C = -2\text{ A}; I_B = -200\text{ mA}; \text{note 1}$	–	<55	<80	$\text{m}\Omega$
V_{CEsat}	collector-emitter saturation voltage	$I_C = -5\text{ A}; I_B = -500\text{ mA}$	–	–250	–375	mV
V_{BEsat}	base-emitter saturation voltage	$I_C = -5\text{ A}; I_B = -500\text{ mA}$	–	–	–1.3	V
V_{BEon}	base-emitter turn-on voltage	$V_{CE} = -2\text{ V}; I_C = -2\text{ A}$	–	–0.8	–1.25	V
f_T	transition frequency	$I_C = -100\text{ mA}; V_{CE} = -10\text{ V}; f = 100\text{ MHz}$	60	120	–	MHz
C_c	collector capacitance	$V_{CB} = -10\text{ V}; I_E = I_C = 0; f = 1\text{ MHz}$	–	90	105	pF

Note

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

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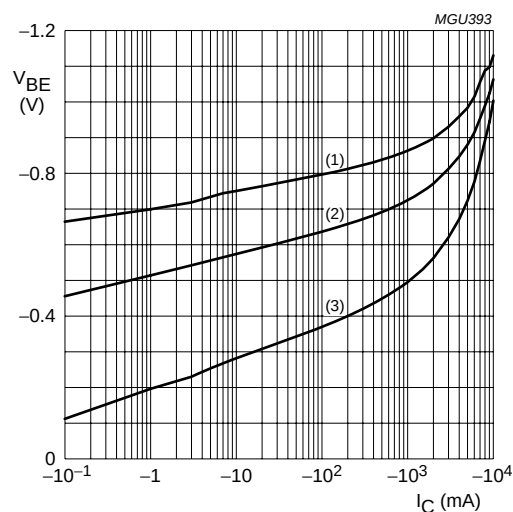
$V_{CE} = -2$ V.

(1) $T_{amb} = 150$ °C.

(2) $T_{amb} = 25$ °C.

(3) $T_{amb} = -55$ °C.

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



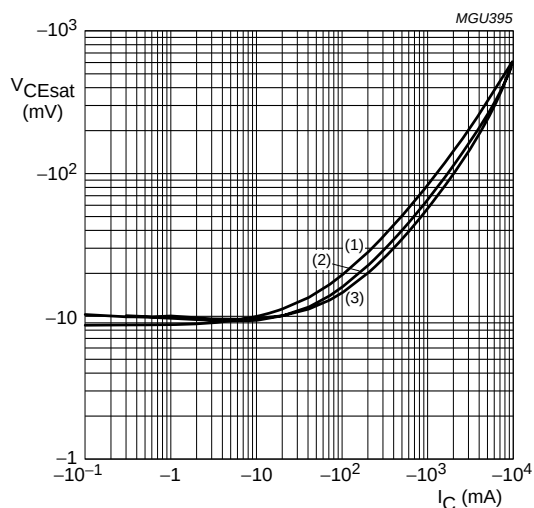
$V_{CE} = -2$ V.

(1) $T_{amb} = 150$ °C.

(2) $T_{amb} = 25$ °C.

(3) $T_{amb} = -55$ °C.

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



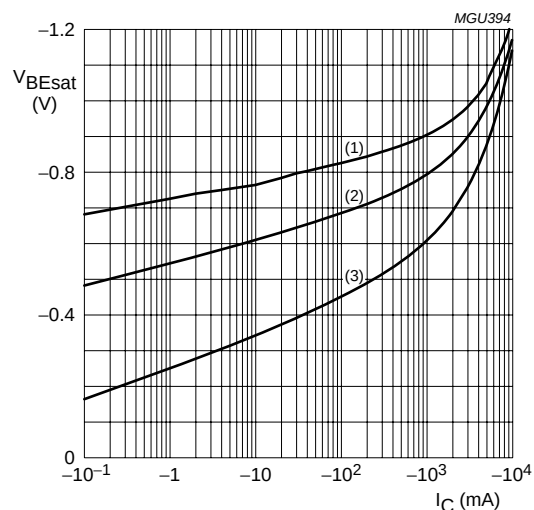
$I_C/I_B = 20$.

(1) $T_{amb} = 150$ °C.

(2) $T_{amb} = 25$ °C.

(3) $T_{amb} = -55$ °C.

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



$I_C/I_B = 20$.

(1) $T_{amb} = 150$ °C.

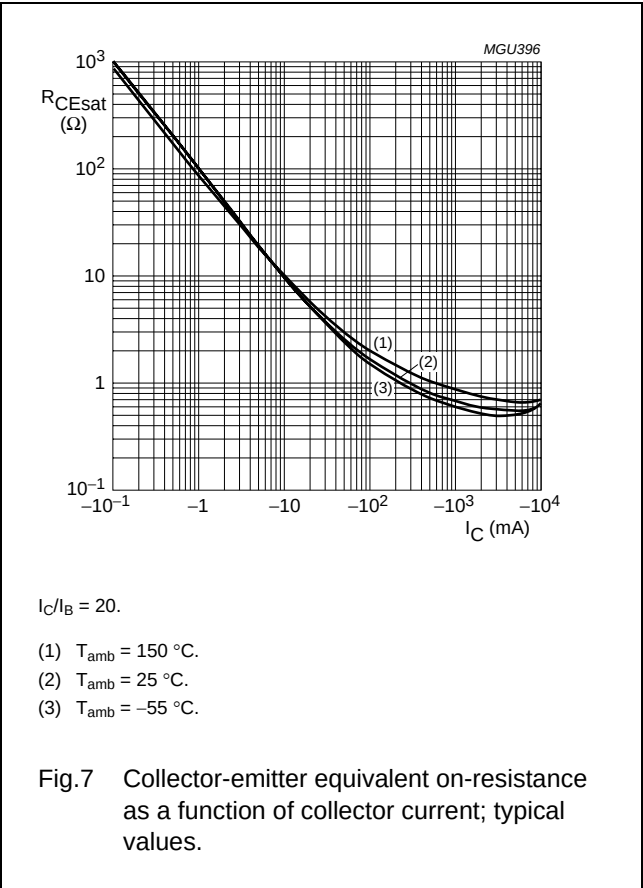
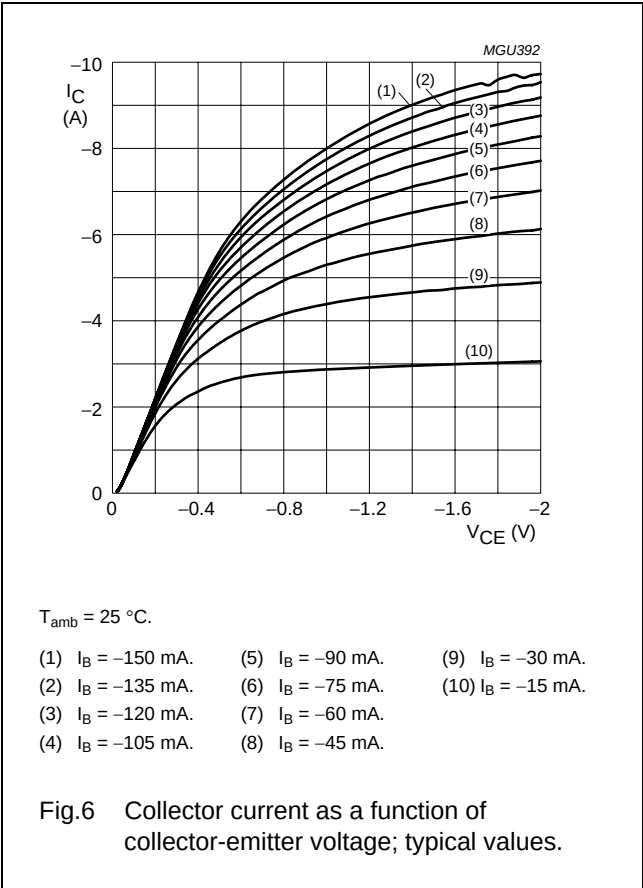
(2) $T_{amb} = 25$ °C.

(3) $T_{amb} = -55$ °C.

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

40 V low V_{CEsat} PNP transistor

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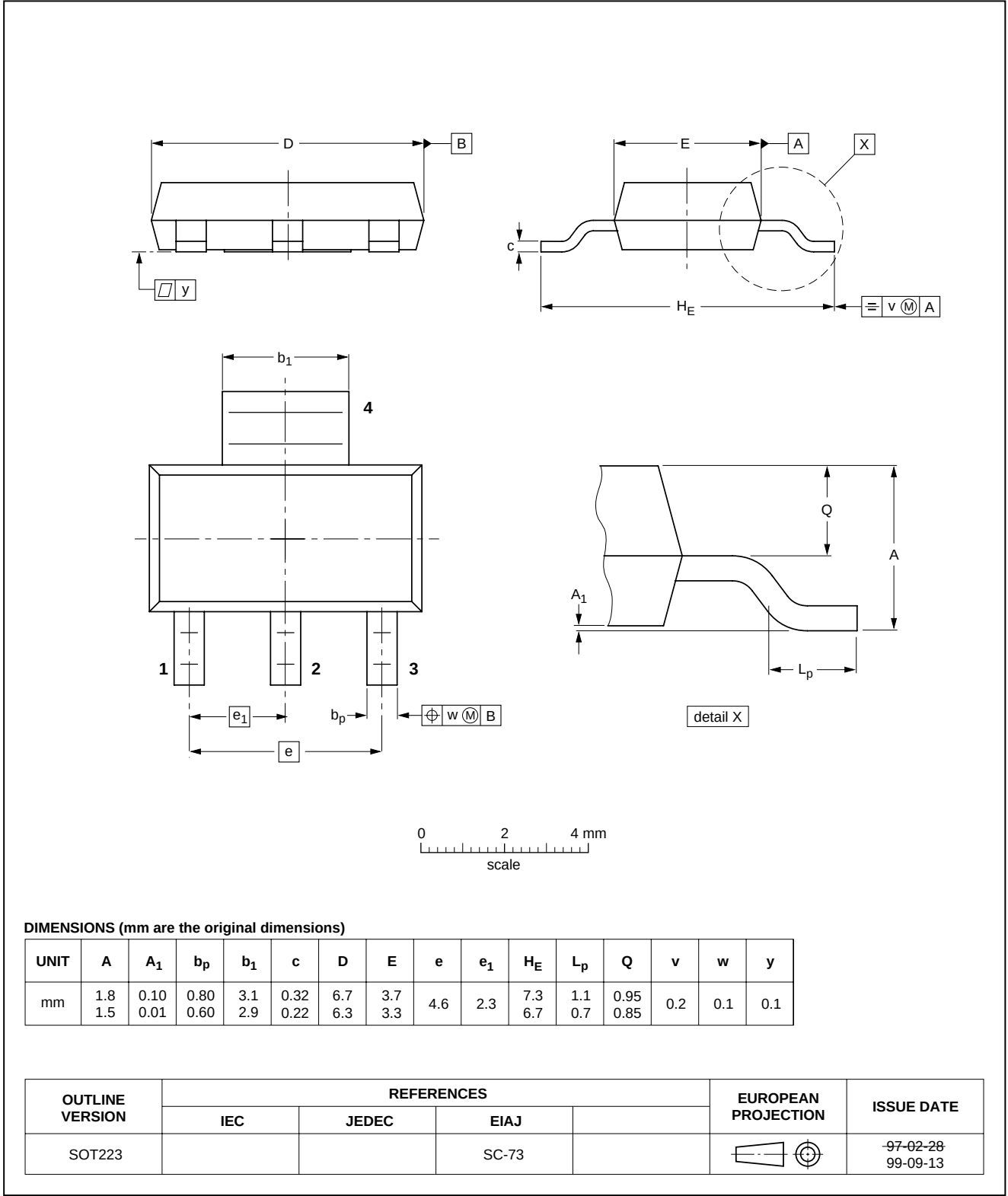
40 V low V_{CEsat} PNP transistor

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PACKAGE OUTLINE

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

SOT223



40 V low V_{CEsat} PNP transistor

PBSS5540Z

DATA SHEET STATUS

DOCUMENT STATUS ⁽¹⁾	PRODUCT STATUS ⁽²⁾	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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