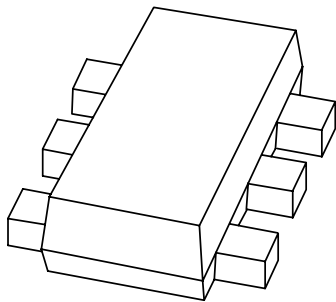


# DATA SHEET



## **PBSS4140V** 40 V low $V_{CEsat}$ NPN transistor

Product specification  
Supersedes data of 2001 Nov 05

2002 Jun 20

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

# PBSS4140V

### FEATURES

- 300 mW total power dissipation
- Very small 1.6 mm x 1.2 mm x 0.55 mm ultra thin package
- Improved thermal behaviour due to flat leads
- Excellent coplanarity due to straight leads
- Low collector-emitter saturation voltage
- High current capabilities
- Reduced required PCB area.

### APPLICATIONS

- General purpose switching and muting
- LCD backlighting
- Supply line switching circuits
- Battery driven equipment (mobile phones, video cameras and hand-held devices).

### DESCRIPTION

NPN low  $V_{CEsat}$  transistor with high current capability in a SOT666 plastic package. PNP complement: PBSS5140V.

### MARKING

TYPE NUMBER	MARKING CODE
PBSS4140V	22

### QUICK REFERENCE DATA

SYMBOL	PARAMETER	MAX.	UNIT
$V_{CEO}$	collector-emitter voltage	40	V
$I_C$	collector current (DC)	1	A
$I_{CRP}$	peak collector current	2	A
$R_{CEsat}$	equivalent on-resistance	<190	m $\Omega$

### PINNING

PIN	DESCRIPTION
1	collector
2	collector
3	base
4	emitter
5	collector
6	collector

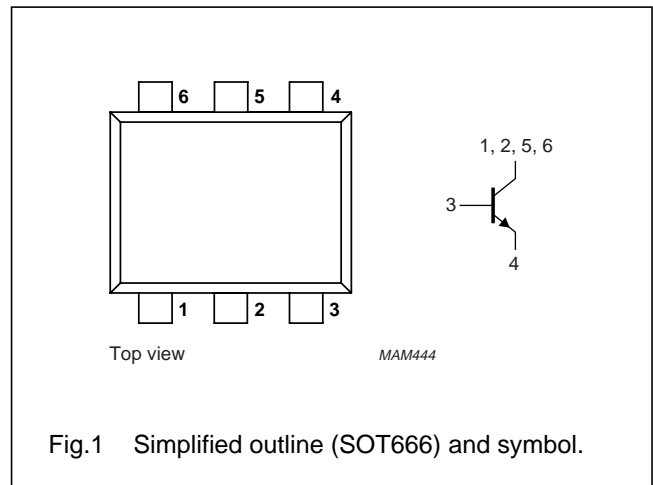


Fig.1 Simplified outline (SOT666) and symbol.

40 V low  $V_{CEsat}$  NPN transistor

## PBSS4140V

**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	–	5	V
$I_C$	collector current (DC)		–	1	A
$I_{CM}$	peak collector current		–	3	A
$I_{CRP}$	repetitive peak collector current	note 1	–	2	A
$I_B$	base current (DC)		–	300	mA
$I_{BM}$	peak base current		–	1	A
$P_{tot}$	total power dissipation	$T_{amb} \leq 25\text{ °C}$ ; note 2	–	300	mW
		$T_{amb} \leq 25\text{ °C}$ ; note 3	–	500	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**

1. Operated under pulsed conditions:  $t_p \leq 30\text{ ms}$ ;  $\delta \leq 0.2$ .
2. Device mounted on a printed-circuit board; single sided copper; tinplated; standard footprint.
3. Device mounted on a printed-circuit board; single sided copper; tinplated; mounting pad for collector  $1\text{ cm}^2$ .

**THERMAL CHARACTERISTICS**

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-a}$	thermal resistance from junction to ambient	note 1	410	K/W
		note 2	215	K/W
		notes 1 and 3	110	K/W

**Notes**

1. Device mounted on a printed circuit board; single sided copper; tinplated; standard footprint.
2. Device mounted on a printed-circuit board; single sided copper; tinplated; mounting pad for collector  $1\text{ cm}^2$ .
3. Operated under pulsed conditions:  $t_p \leq 30\text{ ms}$ ;  $\delta \leq 0.2$ .

**Soldering**

The only recommended soldering method is reflow soldering.

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**CHARACTERISTICS**

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

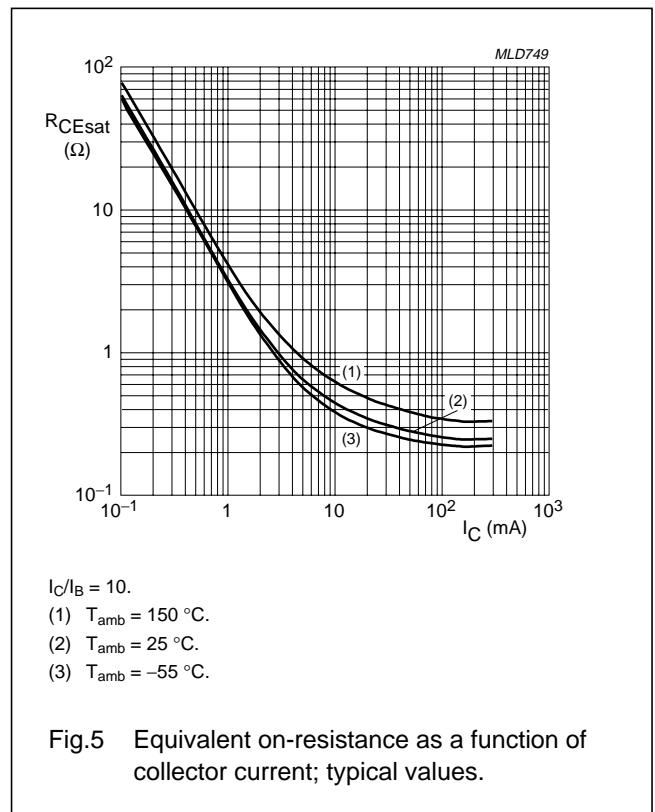
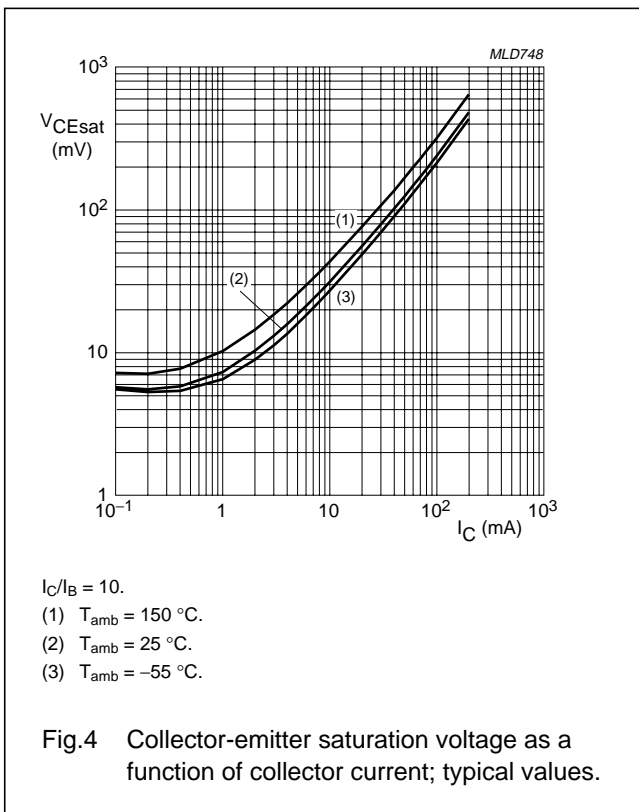
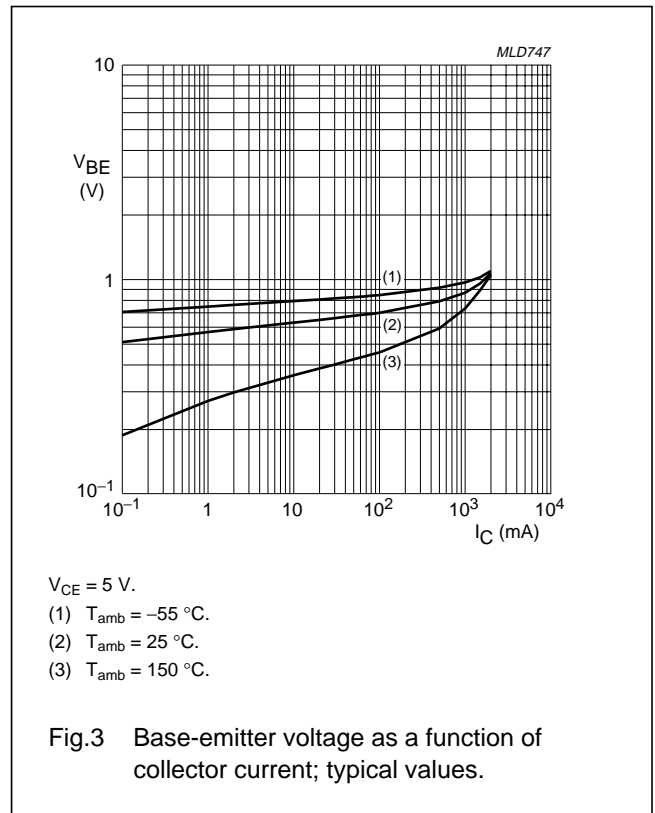
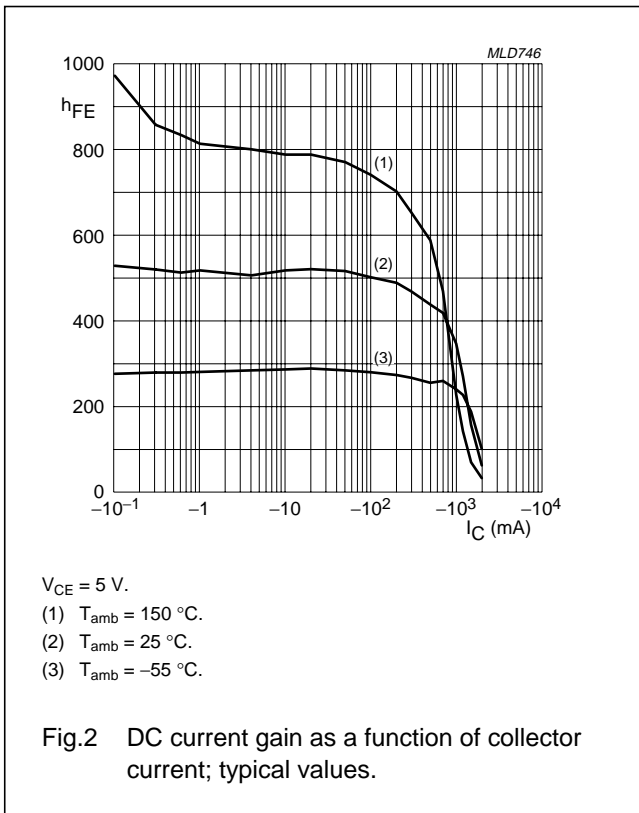
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$I_{CBO}$	collector-base cut-off current	$V_{CB} = 40\text{ V}; I_E = 0$	–	–	100	nA
		$V_{CB} = 40\text{ V}; I_E = 0; T_{amb} = 150\text{ °C}$	–	–	50	$\mu\text{A}$
$I_{CEO}$	collector-emitter cut-off current	$V_{CE} = 30\text{ V}; I_B = 0$	–	–	100	nA
$I_{EBO}$	emitter-base cut-off current	$V_{EB} = 5\text{ V}; I_C = 0$	–	–	100	nA
$h_{FE}$	DC current gain	$V_{CE} = 5\text{ V}; I_C = 1\text{ mA}$	300	–	–	
		$V_{CE} = 5\text{ V}; I_C = 500\text{ mA}$	300	–	900	
		$V_{CE} = 5\text{ V}; I_C = 1\text{ A}$	200	–	–	
		$V_{CE} = 5\text{ V}; I_C = 2\text{ A}; \text{note 1}$	75	–	–	
$V_{CEsat}$	collector-emitter saturation voltage	$I_C = 100\text{ mA}; I_B = 1\text{ mA}$	–	50	80	mV
		$I_C = 500\text{ mA}; I_B = 50\text{ mA}$	–	70	110	mV
		$I_C = 1\text{ A}; I_B = 100\text{ mA}; \text{note 1}$	–	150	190	mV
		$I_C = 2\text{ A}; I_B = 200\text{ mA}; \text{note 1}$	–	320	440	mV
$R_{CEsat}$	equivalent on-resistance	$I_C = 1\text{ A}; I_B = 100\text{ mA}; \text{note 1}$	–	150	<190	$\text{m}\Omega$
$V_{BEsat}$	base-emitter saturation voltage	$I_C = 1\text{ A}; I_B = 100\text{ mA}$	–	–	1.2	V
$V_{BEon}$	base-emitter turn-on voltage	$V_{CE} = 5\text{ V}; I_C = 1\text{ A}$	–	–	1.1	V
$f_T$	transition frequency	$I_C = 50\text{ mA}; V_{CE} = 10\text{ V}; f = 100\text{ MHz}$	150	–	–	MHz
$C_c$	collector capacitance	$V_{CB} = 10\text{ V}; I_E = I_e = 0; f = 1\text{ MHz}$	–	–	10	pF

**Note**

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

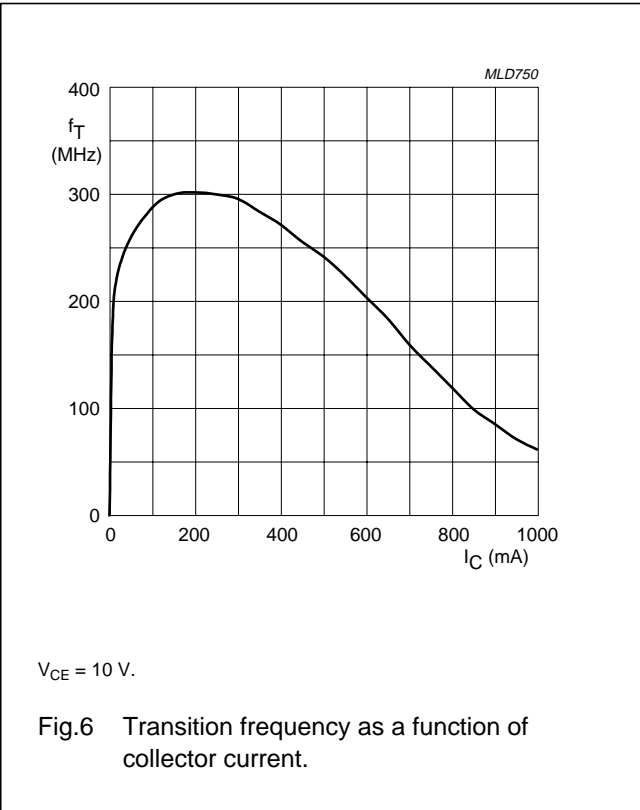
40 V low  $V_{CEsat}$  NPN transistor

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40 V low  $V_{CEsat}$  NPN transistor

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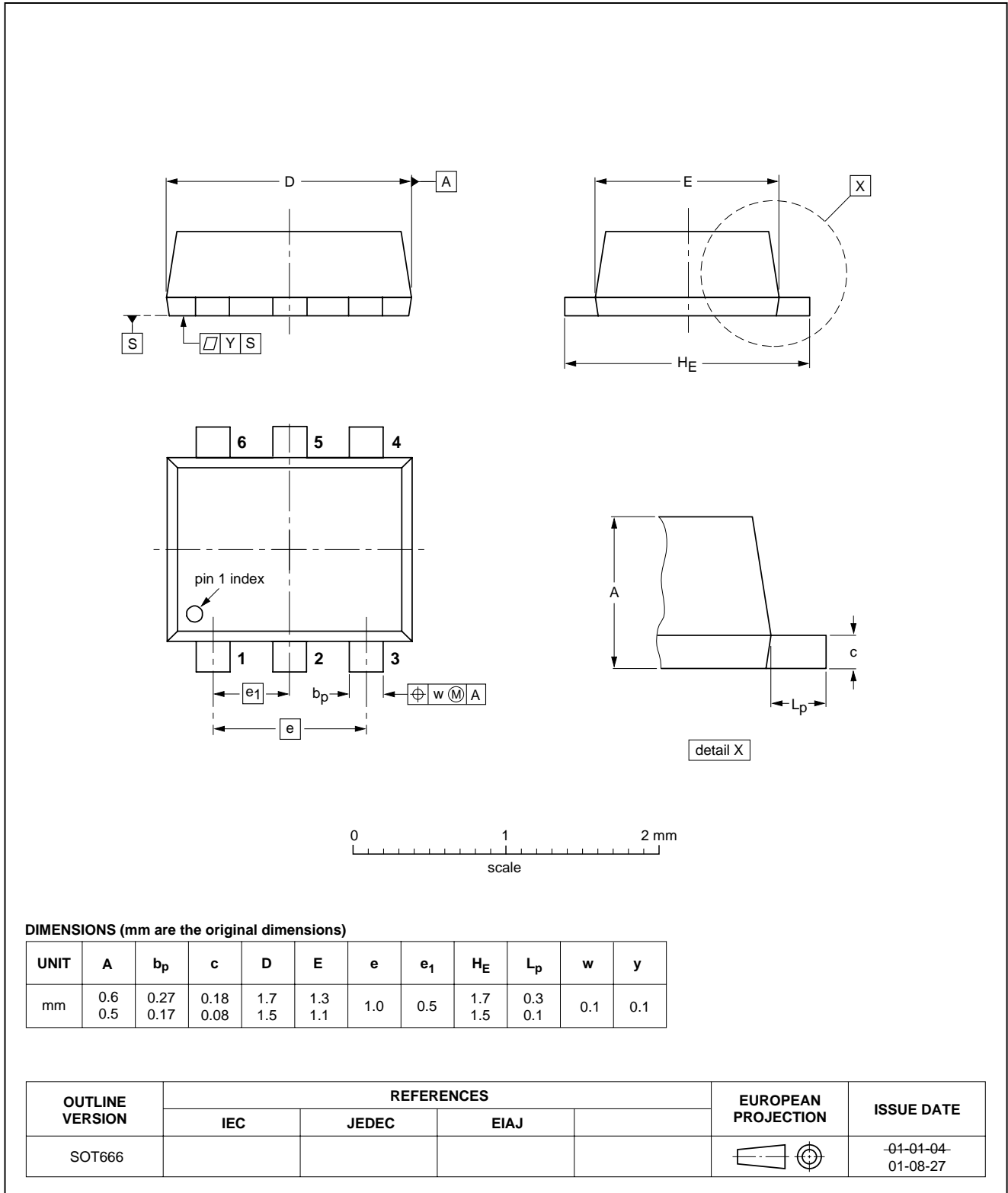
40 V low  $V_{CEsat}$  NPN transistor

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PACKAGE OUTLINE

Plastic surface mounted package; 6 leads

SOT666



40 V low  $V_{CEsat}$  NPN transistor

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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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**NOTES**

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Printed in The Netherlands

613514/02/pp12

Date of release: 2002 Jun 20

Document order number: 9397 750 09428

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