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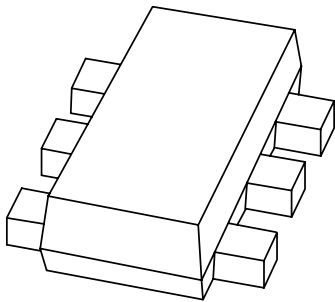
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Kind regards,

Team Nexperia

DATA SHEET



PBSS5240V

40 V low V_{CEsat} PNP transistor

Product data sheet

2003 Jan 30

40 V low V_{CEsat} PNP transistor

PBSS5240V

FEATURES

- Low collector-emitter saturation voltage V_{CEsat}
- High collector current capability I_C and I_{CM}
- High collector current gain (h_{FE}) at high I_C
- High efficiency leading to reduced heat generation
- Reduced printed-circuit board area requirements.

APPLICATIONS

- Power management:
 - DC-DC converter
 - Supply line switching
 - Battery charger
 - LCD back lighting.
- Peripheral driver:
 - Driver in low supply voltage applications (e.g. lamps, LEDs)
 - Inductive load drivers (e.g. relay, buzzers and motors).

DESCRIPTION

PNP transistor providing low V_{CEsat} and high current capability in a SOT666 plastic package.
NPN complement: PBSS4240V.

MARKING

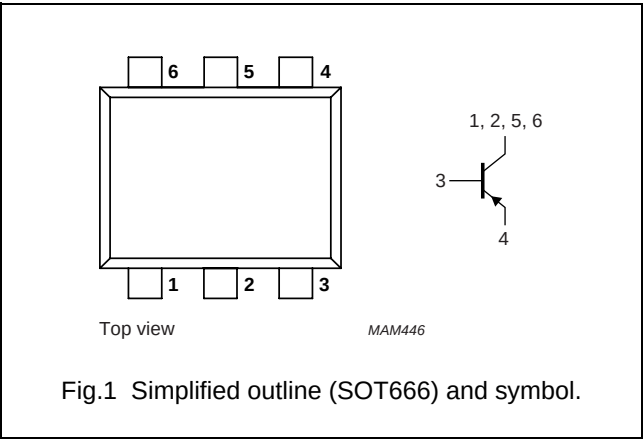
TYPE NUMBER	MARKING CODE
PBSS5240V	52

QUICK REFERENCE DATA

SYMBOL	PARAMETER	MAX.	UNIT
V_{CEO}	collector-emitter voltage	−40	V
I_C	collector current (DC)	−1.8	A
I_{CRP}	peak collector current	−2	A
R_{CEsat}	equivalent on-resistance	<250	mΩ

PINNING

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



40 V low V_{CEsat} PNP transistor

PBSS5240V

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)	note 1	–	–1.8	A
I_{CRP}	peak repetitive collector current	note 2	–	–2	A
I_{CM}	peak collector current		–	–3	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 3	–	300	mW
		$T_{amb} \leq 25\text{ °C}$; note 4	–	500	mW
		$T_{amb} \leq 25\text{ °C}$; note 1	–	900	mW
		$T_{amb} \leq 25\text{ °C}$; notes 2 and 3	–	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. Device mounted on a ceramic circuit board, Al_2O_3 , standard footprint.
2. Operated under pulsed conditions: duty cycle $\delta \leq 20\%$, pulse width $t_p \leq 30\text{ ms}$.
3. Device mounted on a printed-circuit board, single-sided copper, tinplated, standard footprint.
4. Device mounted on a printed-circuit board, single-sided copper, tinplated, mounting pad for collector 1 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
		note 3	140	K/W
		notes 1 and 4	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 cm^2 .
3. Device mounted on a ceramic circuit board, Al_2O_3 , standard footprint.
4. Operated under pulsed conditions: duty cycle $\delta \leq 20\%$, pulse width $t_p \leq 30\text{ ms}$.

Soldering

The only recommended soldering method is reflow soldering.

40 V low V_{CEsat} PNP transistor

PBSS5240V

CHARACTERISTICS

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

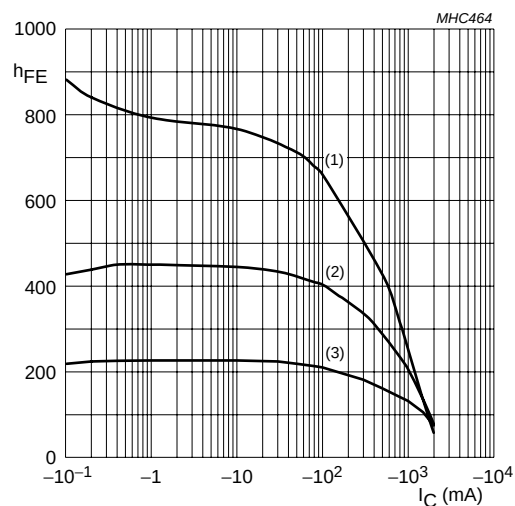
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_{CBO}	collector-base cut-off current	$V_{CB} = -40\text{ V}; I_E = 0$	–	–	–100	nA
		$V_{CB} = -40\text{ V}; I_E = 0; T_{amb} = 150\text{ °C}$	–	–	–50	μA
I_{CEO}	collector-emitter cut-off current	$V_{CE} = -30\text{ V}; I_B = 0$	–	–	–100	nA
I_{EBO}	emitter-base 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	–	–	
		$V_{CE} = -5\text{ V}; I_C = -100\text{ mA}$	300	–	800	
		$V_{CE} = -5\text{ V}; I_C = -500\text{ mA}$	250	–	–	
		$V_{CE} = -5\text{ V}; I_C = -1\text{ A}$	160	–	–	
		$V_{CE} = -5\text{ V}; I_C = -2\text{ A}; \text{note 1}$	50	–	–	
V_{CEsat}	collector-emitter saturation voltage	$I_C = -100\text{ mA}; I_B = -1\text{ mA}$	–	–80	–120	mV
		$I_C = -500\text{ mA}; I_B = -50\text{ mA}$	–	–100	–145	mV
		$I_C = -1\text{ A}; I_B = -100\text{ mA}; \text{note 1}$	–	–180	–250	mV
		$I_C = -2\text{ A}; I_B = -200\text{ mA}$	–	–370	–530	mV
R_{CEsat}	equivalent on-resistance	$I_C = -1\text{ A}; I_B = -100\text{ mA}; \text{note 1}$	–	180	<250	$\text{m}\Omega$
V_{BEsat}	base-emitter saturation voltage	$I_C = -1\text{ A}; I_B = -100\text{ mA}$	–	–	–1.1	V
V_{BEon}	base-emitter turn-on voltage	$V_{CE} = -5\text{ V}; I_C = -1\text{ A}$	–	–	–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	$V_{CB} = -10\text{ V}; I_E = I_e = 0; f = 1\text{ MHz}$	–	–	12	pF

Note

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

40 V low V_{CEsat} PNP transistor

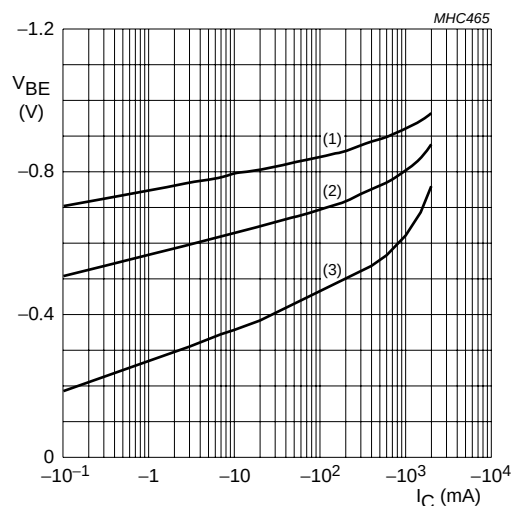
PBSS5240V



$V_{CE} = -5$ V.

- (1) $T_{amb} = 150$ °C.
- (2) $T_{amb} = 25$ °C.
- (3) $T_{amb} = -55$ °C.

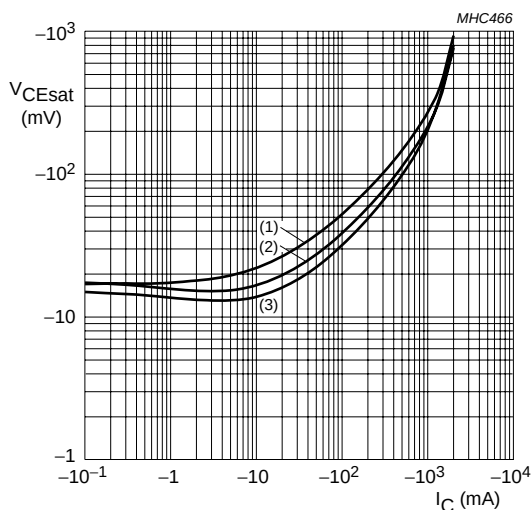
Fig.2 DC current gain as a function of collector current; typical values.



$V_{CE} = -5$ V.

- (1) $T_{amb} = -55$ °C.
- (2) $T_{amb} = 25$ °C.
- (3) $T_{amb} = 150$ °C.

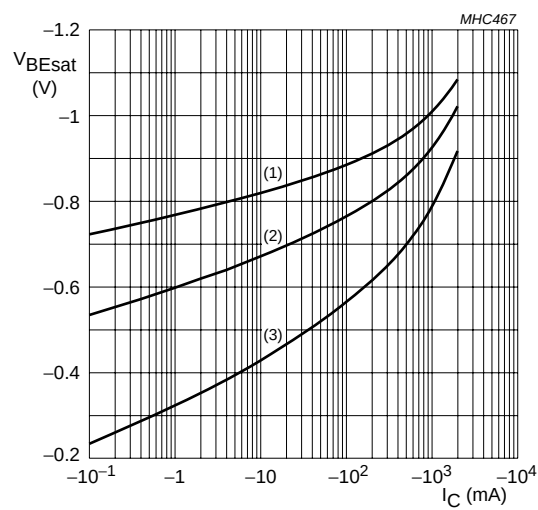
Fig.3 Base-emitter voltage as a function of collector current; typical values.



$I_C/I_B = 20$.

- (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.



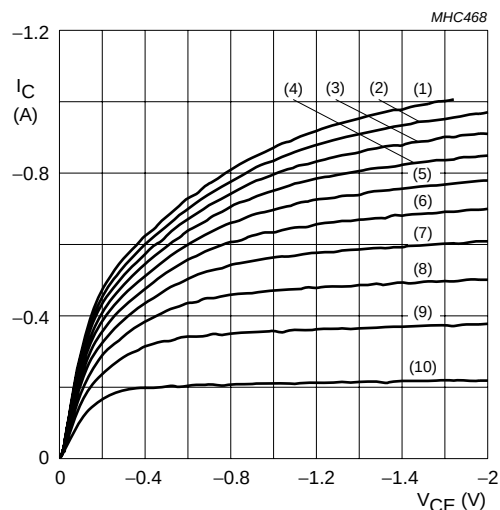
$I_C/I_B = 20$.

- (1) $T_{amb} = -55$ °C.
- (2) $T_{amb} = 25$ °C.
- (3) $T_{amb} = 150$ °C.

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

40 V low V_{CEsat} PNP transistor

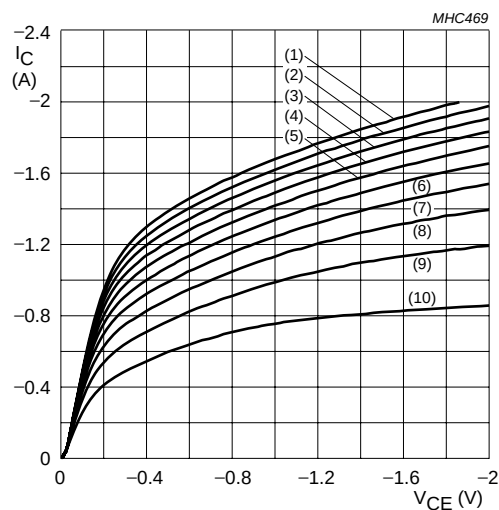
PBSS5240V



$T_{amb} = 25\text{ °C}$.

- | | | |
|------------------------------|------------------------------|-------------------------------|
| (1) $I_B = -7\text{ mA}$. | (5) $I_B = -4.2\text{ mA}$. | (9) $I_B = -1.4\text{ mA}$. |
| (2) $I_B = -6.3\text{ mA}$. | (6) $I_B = -3.5\text{ mA}$. | (10) $I_B = -0.7\text{ mA}$. |
| (3) $I_B = -5.6\text{ mA}$. | (7) $I_B = -2.8\text{ mA}$. | |
| (4) $I_B = -4.9\text{ mA}$. | (8) $I_B = -2.1\text{ mA}$. | |

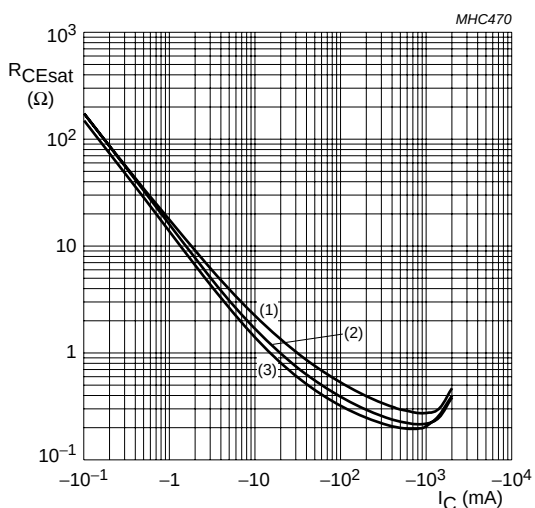
Fig.6 Collector current as a function of collector-emitter voltage; typical values.



$T_{amb} = 25\text{ °C}$.

- | | | |
|-----------------------------|-----------------------------|-----------------------------|
| (1) $I_B = -50\text{ mA}$. | (5) $I_B = -30\text{ mA}$. | (9) $I_B = -10\text{ mA}$. |
| (2) $I_B = -45\text{ mA}$. | (6) $I_B = -25\text{ mA}$. | (10) $I_B = -5\text{ mA}$. |
| (3) $I_B = -40\text{ mA}$. | (7) $I_B = -20\text{ mA}$. | |
| (4) $I_B = -35\text{ mA}$. | (8) $I_B = -15\text{ mA}$. | |

Fig.7 Collector current as a function of collector-emitter voltage; typical values.



$I_C/I_B = 20$.

- | | | |
|---------------------------------|--------------------------------|---------------------------------|
| (1) $T_{amb} = 150\text{ °C}$. | (2) $T_{amb} = 25\text{ °C}$. | (3) $T_{amb} = -55\text{ °C}$. |
|---------------------------------|--------------------------------|---------------------------------|

Fig.8 Collector-emitter equivalent on-resistance as a function of collector current; typical values.

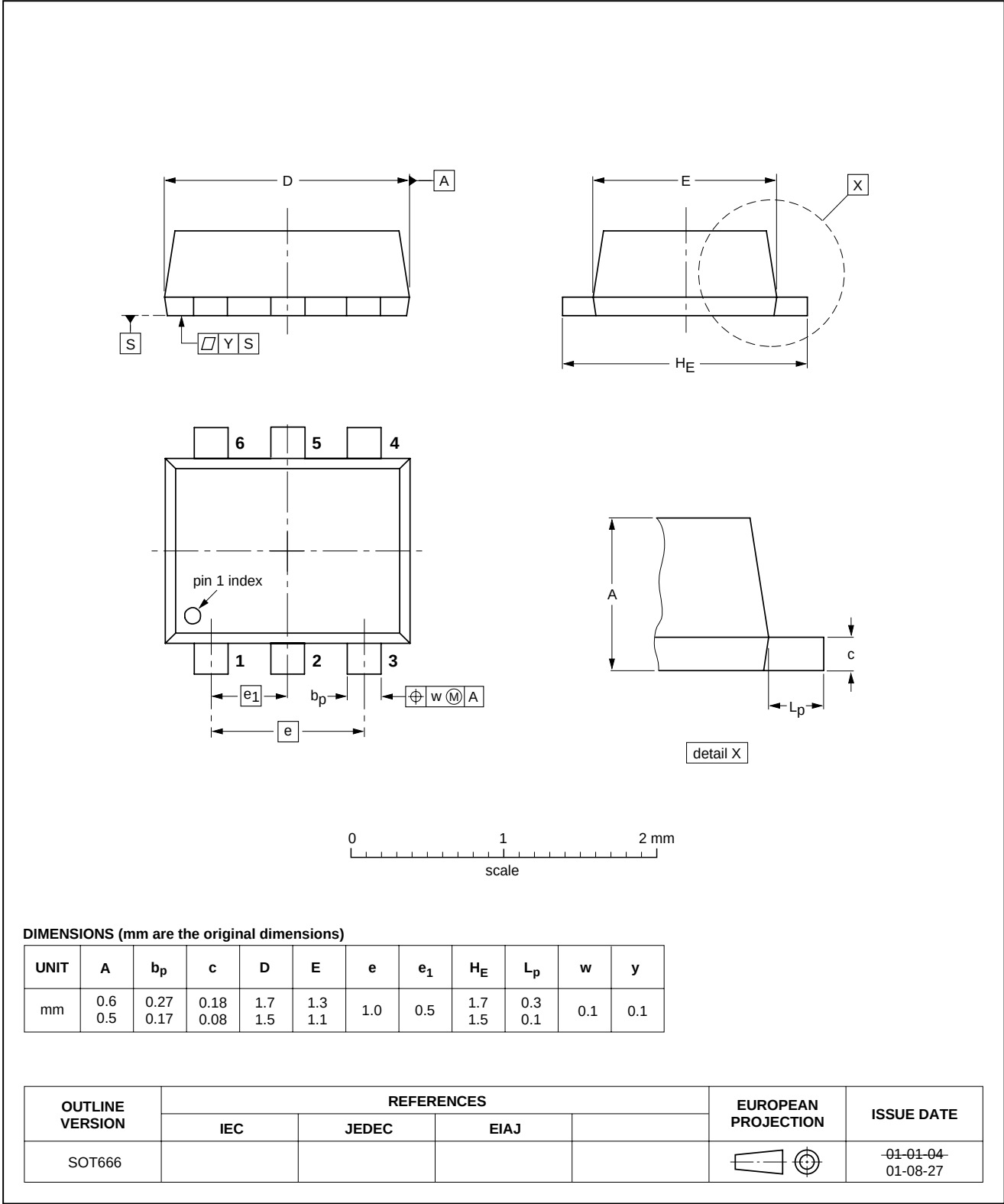
40 V low V_{CEsat} PNP transistor

PBSS5240V

PACKAGE OUTLINE

Plastic surface mounted package; 6 leads

SOT666



40 V low V_{CEsat} PNP transistor

PBSS5240V

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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NXP Semiconductors

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