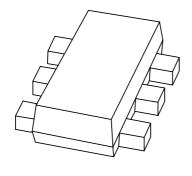
DISCRETE SEMICONDUCTORS

DATA SHEET



PBSS4240V 40 V low V_{CEsat} NPN transistor

Product data sheet 2003 Jan 30



40 V low V_{CEsat} NPN transistor

PBSS4240V

FEATURES

- Low collector-emitter saturation voltage V_{CEsat}
- High collector current capability I_C and I_{CM}
- High collector current gain (hFE) at high IC
- 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 and LEDs)
 - Inductive load drivers (e.g. relay, buzzers and motors).

DESCRIPTION

NPN transistor providing low V_{CEsat} and high current capability in a SOT666 plastic package. PNP complement: PBSS5240V.

MARKING

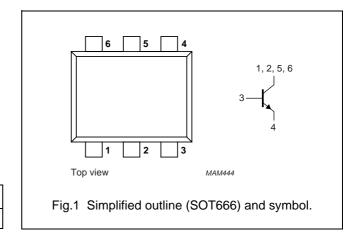
TYPE NUMBER	MARKING CODE		
PBSS4240V	42		

QUICK REFERENCE DATA

SYMBOL	PARAMETER	MAX.	UNIT
V _{CEO}	collector-emitter voltage	40	V
I _C	collector current (DC)		Α
I _{CRP} peak collector current		2	Α
R _{CEsat} equivalent on-resistance		<190	mΩ

PINNING

PIN	DESCRIPTION	
1	collector	
2	collector	
3	base	
4	emitter	
5	collector	
6	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	_	5	V
I _C	collector current (DC)	note 1	_	2	Α
I _{CRP}	repetitive peak collector current	note 2	_	2	Α
I _{CM}	peak collector current		_	3	Α
I _B	base current (DC)		_	300	mA
I _{BM}	peak base current		_	1	Α
P _{tot}	total power dissipation	T _{amb} ≤ 25 °C; note 3	_	300	mW
		T _{amb} ≤ 25 °C; note 4	_	500	mW
		T _{amb} ≤ 25 °C; note 1	_	900	mW
		T _{amb} ≤ 25 °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, Al₂O₃, standard footprint.
- 2. Operated under pulsed conditions: duty cycle $\delta \leq$ 20%, pulse width $t_p \leq$ 30 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 cm².

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
R _{th j-a}	thermal resistance from junction to	note 1	410	K/W
	ambient	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 cm².
- 3. Device mounted on a ceramic circuit board, Al₂O₃, standard footprint.
- 4. Operated under pulsed conditions: duty cycle $\delta \leq$ 20%, pulse width $t_p \leq$ 30 ms.

Soldering

The only recommended soldering method is reflow soldering.

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CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I _{CBO} collector-base cut-off current		V _{CB} = 40 V; I _E = 0	_	_	100	nA
		V _{CB} = 40 V; I _E = 0; T _{amb} = 150 °C	_	_	50	μΑ
I _{CEO}	collector-emitter cut-off current	V _{CE} = 30 V; I _B = 0	_	_	100	nA
I _{EBO}	emitter-base cut-off current	V _{EB} = 5 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 V; I _C = 1 A	200	-	_	
		V _{CE} = 5 V; I _C = 2 A; note 1	75	_	_	
V _{CEsat}	collector-emitter saturation voltage	I _C = 100 mA; I _B = 1 mA	-	50	75	mV
		$I_C = 500 \text{ mA}; I_B = 50 \text{ mA}$	-	70	100	mV
		I _C = 1 A; I _B = 100 mA; note 1	-	150	190	mV
		I _C = 2 A; I _B = 200 mA; note 1	-	300	400	mV
R _{CEsat}	equivalent on-resistance	I _C = 1 A; I _B = 100 mA; note 1	-	150	<190	mΩ
V _{BEsat}	base-emitter saturation voltage	I _C = 1 A; I _B = 100 mA	-	_	1.2	V
V_{BEon}	base-emitter turn-on voltage	V _{CE} = 5 V; I _C = 1 A	-	_	1.1	V
f _T	transition frequency	I _C = 50 mA; V _{CE} = 10 V; f = 100 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: $t_p \leq 300~\mu s;~\delta \leq 0.02.$

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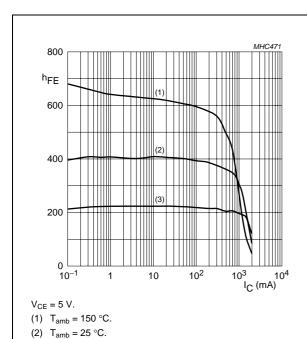
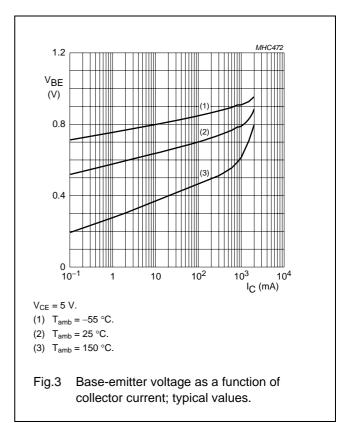
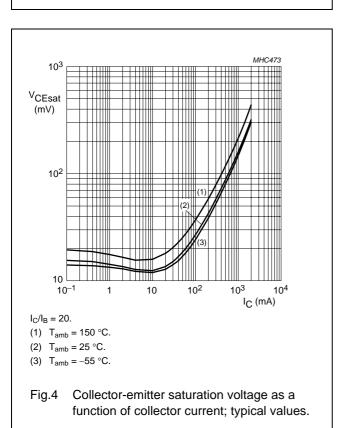
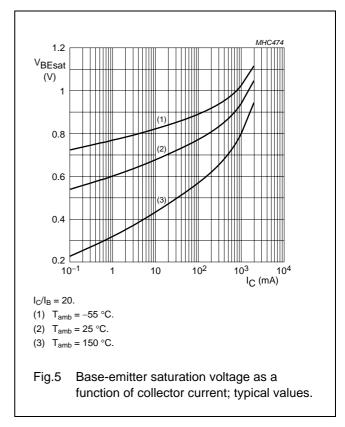


Fig.2 DC current gain as a function of collector current; typical values.

(3) $T_{amb} = -55 \, ^{\circ}C$.

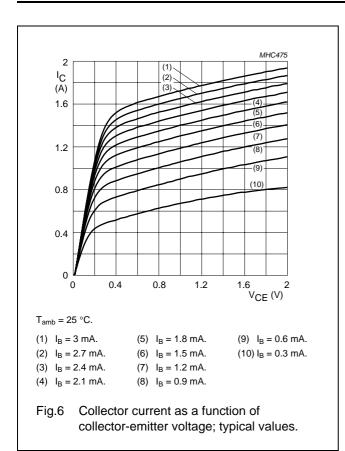






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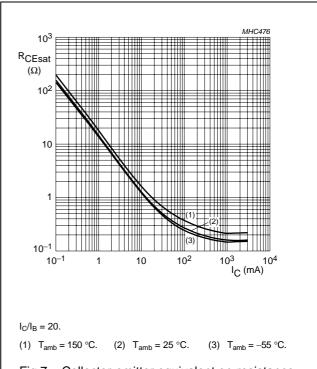


Fig.7 Collector-emitter equivalent on-resistance as a function of collector current; typical values.

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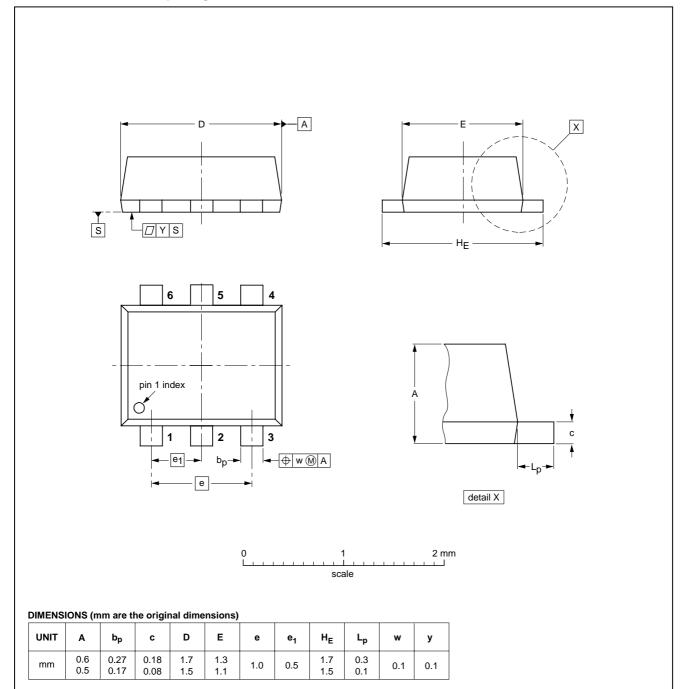
40 V low V_{CEsat} NPN transistor

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PACKAGE OUTLINE

Plastic surface mounted package; 6 leads

SOT666



OUTLINE	REFERENCES			EUROPEAN ISSUE DATE			
VERSION	IEC	JEDEC	EIAJ		PROJECTION	ISSUE DATE	
SOT666						-01-01-04 01-08-27	

40 V low V_{CEsat} NPN transistor

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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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