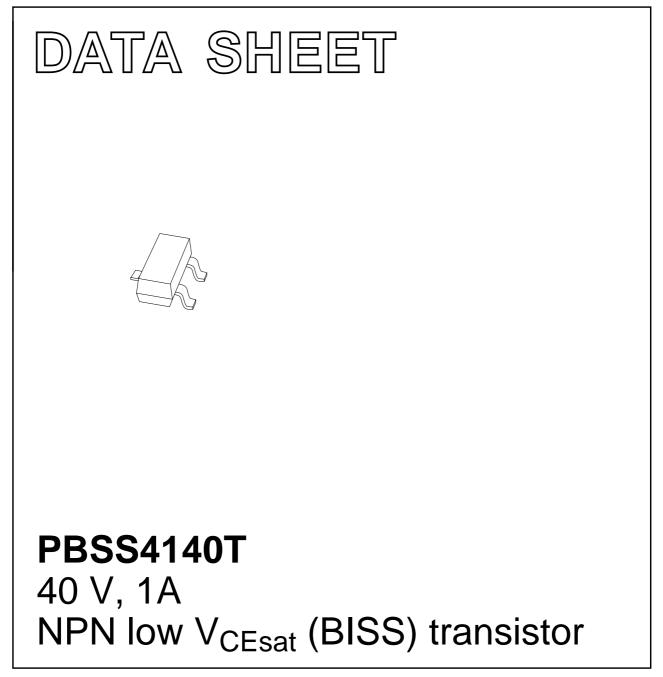
DISCRETE SEMICONDUCTORS



Product specification Supersedes data of 2001 Jul 13 2004 Mar 16



40 V, 1A NPN low V_{CEsat} (BISS) transistor

FEATURES

- Low collector-emitter saturation voltage
- High current capabilities.
- Improved device reliability due to reduced heat generation.

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 in a SOT23 plastic package. PNP complement: PBSS5140T.

MARKING

TYPE NUMBER	MARKING CODE ⁽¹⁾	
PBSS4140T	ZT*	

Note

- 1. * = p: made in Hong Kong.
 - * = t: made in Malaysia.
 - * = W: made in China.

ORDERING INFORMATION

TYPE NUMBER PACKAGE NAME DESCRIPTION VERSION PBSS4140T plastic surface mounted package; 3 leads SOT23

QUICK REFERENCE DATA

SYMBOL	PARAMETER	MAX.	UNIT
V _{CEO}	collector-emitter voltage	40	V
I _{CM}	peak collector current	2	A
R _{CEsat}	Esat equivalent on-resistance		mΩ

PINNING

PIN	DESCRIPTION	
1	base	
2	emitter	
3	collector	

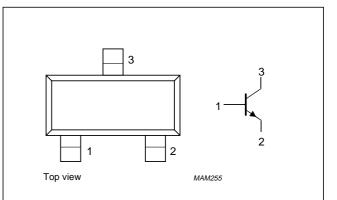


Fig.1 Simplified outline (SOT23) and symbol.

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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)		-	1	A
I _{CM}	peak collector current		-	2	A
I _{BM}	peak base current		-	1	A
P _{tot}	total power dissipation	T _{amb} ≤ 25 °C; note 1	-	300	mW
		T _{amb} ≤ 25 °C; note 2	-	450	mW
T _{stg}	storage temperature		-65	+150	°C
Tj	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; standard footprint.
- 2. Device mounted on a printed-circuit board; single sided copper; tinplated; mounting pad for collector 1 cm².

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	TYPICAL	UNIT
R _{th(j-a)}	thermal resistance from junction	in free air; note 1	417	K/W
	to ambient	in free air; note 2	278	K/W

Notes

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

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CHARACTERISTICS

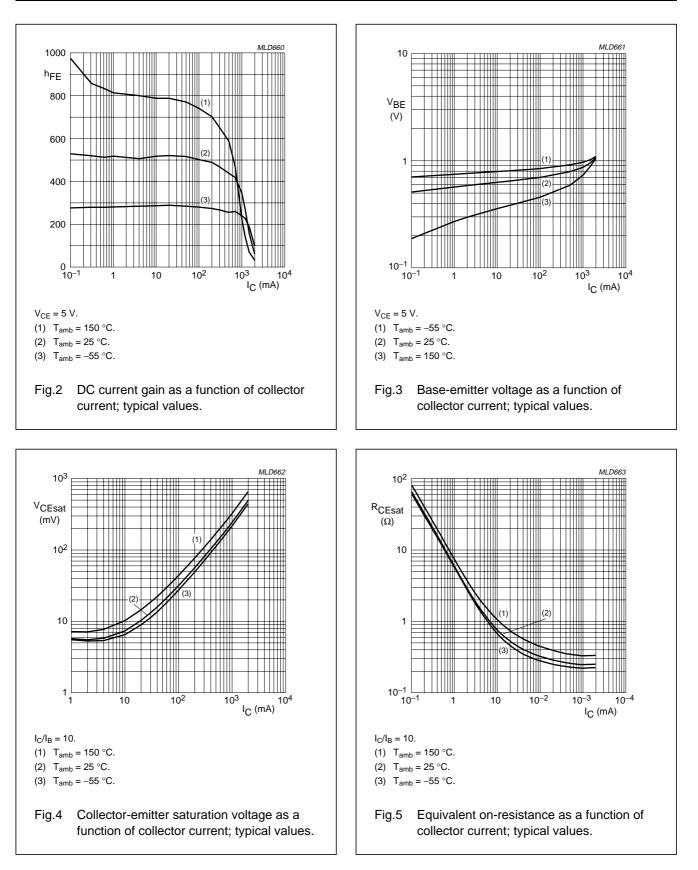
 T_{amb} = 25 °C unless otherwise specified.

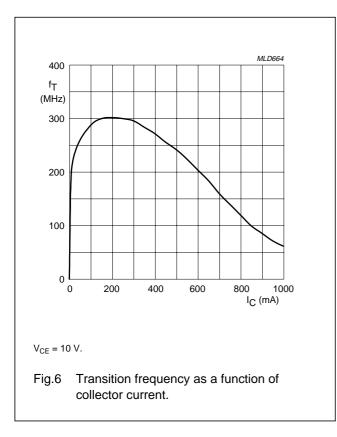
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I _{CBO}	collector-base cut-off	$V_{CB} = 40 \text{ V}; \text{ I}_{E} = 0 \text{ A}$	-	-	100	nA
	current	$V_{CB} = 40 \text{ V}; \text{ I}_{E} = 0 \text{ A}; \text{ T}_{amb} = 150 ^{\circ}\text{C}$	-	-	50	μA
I _{CEO}	collector-emitter cut-off current	V _{CE} = 30 V; I _B = 0 A	-	-	100	nA
I _{EBO}	emitter-base cut-off current	$V_{EB} = 5 \text{ V}; \text{ I}_{C} = 0 \text{ A}$	-	-	100	nA
h _{FE}	DC current gain	V _{CE} = 5 V; I _C = 1 mA	300	-	-	
		V _{CE} = 5 V; I _C = 500 mA	300	-	900	
		$V_{CE} = 5 \text{ V}; \text{ I}_{C} = 1 \text{ A}$	200	-	-	
V _{CEsat} collector-emitter saturation voltage	collector-emitter saturation	I _C = 100 mA; I _B = 1 mA	-	-	200	mV
	voltage	I _C = 500 mA; I _B = 50 mA	-	-	250	mV
		I _C = 1 A; I _B = 100 mA	-	-	500	mV
R _{CEsat}	equivalent on-resistance	I _C = 500 mA; I _B = 50 mA; note 1	-	260	<500	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	$V_{CE} = 5 \text{ V}; \text{ I}_{C} = 1 \text{ A}$	-	_	1.1	V
f _T	transition frequency	$I_{C} = 50 \text{ mA}; V_{CE} = 10 \text{ V}; \text{ f} = 100 \text{ MHz}$	150	-	-	MHz
C _c	collector capacitance	$V_{CB} = 10 \text{ V}; \text{ I}_{E} = \text{ I}_{e} = 0 \text{ A}; \text{ f} = 1 \text{ MHz}$	-	-	10	pF

Note

1. Pulse test: $t_p \le 300 \ \mu s; \ \delta \le 0.02$.

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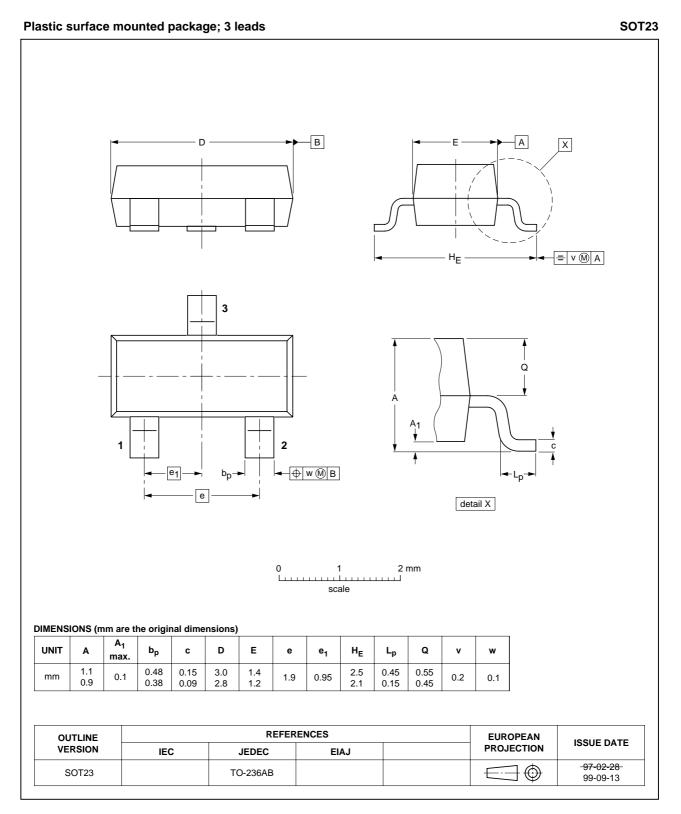


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40 V, 1A NPN low V_{CEsat} (BISS) transistor

PACKAGE OUTLINE



PBSS4140T

DATA SHEET STATUS

LEVEL	DATA SHEET STATUS ⁽¹⁾	PRODUCT STATUS ⁽²⁾⁽³⁾	DEFINITION
I	Objective data	Development	This data sheet contains data from the objective specification for product development. Philips Semiconductors reserves the right to change the specification in any manner without notice.
II	Preliminary data	Qualification	This data sheet contains data from the preliminary specification. Supplementary data will be published at a later date. Philips Semiconductors reserves the right to change the specification without notice, in order to improve the design and supply the best possible product.
	Product data	Production	This data sheet contains data from the product specification. Philips Semiconductors reserves the right to make changes at any time in order to improve the design, manufacturing and supply. Relevant changes will be communicated via a Customer Product/Process Change Notification (CPCN).

Notes

- 1. Please consult the most recently issued data sheet before initiating or completing a design.
- 2. The product status of the device(s) described in this data sheet may have changed since this data sheet was published. The latest information is available on the Internet at URL http://www.semiconductors.philips.com.
- 3. For data sheets describing multiple type numbers, the highest-level product status determines the data sheet status.

DEFINITIONS

Short-form specification — The data in a short-form specification is extracted from a full data sheet with the same type number and title. For detailed information see the relevant data sheet or data handbook.

Limiting values definition — Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 60134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.

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