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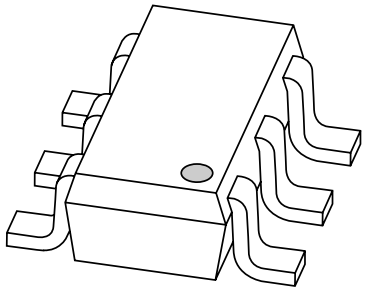
Team Nexperia

DATA SHEET



PBSS4350D

50 V low V_{CEsat} NPN transistor

Product data sheet
Supersedes data of 2001 Jan 26

2001 Jul 13

NXP founded by Philips

50 V low V_{CEsat} NPN transistor PBSS4350D

FEATURES

- Low collector-emitter saturation voltage
- High current capability
- Improved device reliability due to reduced heat generation
- Replacement for SOT89/SOT223 standard packaged transistors due to enhanced performance.

APPLICATIONS

- Supply line switching circuits
- Battery management applications
- DC/DC convertor applications
- Strobe flash units
- Heavy duty battery powered equipment (motor and lamp drivers).

DESCRIPTION

NPN low V_{CEsat} transistor in a SOT457 (SC-74) plastic package. PNP complement: PBSS5350D.

MARKING

TYPE NUMBER	MARKING CODE
PBSS4350D	43

QUICK REFERENCE DATA

SYMBOL	PARAMETER	MAX.	UNIT
V_{CEO}	collector-emitter voltage	50	V
I_{CM}	peak collector current	5	A
R_{CEsat}	equivalent on-resistance	<145	mΩ

PINNING

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

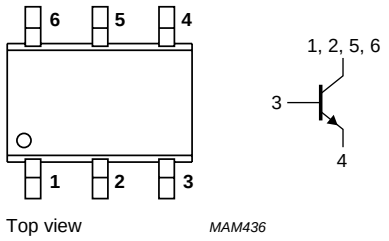


Fig.1 Simplified outline (SOT457; SC-74) and symbol.

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	–	60	V
V_{CEO}	collector-emitter voltage	open base	–	50	V
V_{EBO}	emitter-base voltage	open collector	–	6	V
I_C	collector current (DC)		–	3	A
I_{CM}	peak collector current		–	5	A
I_{BM}	peak base current		–	1	A
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C; note 1	–	600	mW
		$T_{amb} \leq 25$ °C; note 2	–	750	mW
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 and mounting pad for collector 1 cm^2.
2. Device mounted on a printed-circuit board, single sided copper, tinplated and mounting pad for collector 6 cm^2.

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	in free air; note 1	208	K/W
		in free air; note 2	160	K/W

Notes

1. Device mounted on a printed-circuit board, single sided copper, tinplated and mounting pad for collector 1 cm^2.
2. Device mounted on a printed-circuit board, single sided copper, tinplated and mounting pad for collector 6 cm^2.

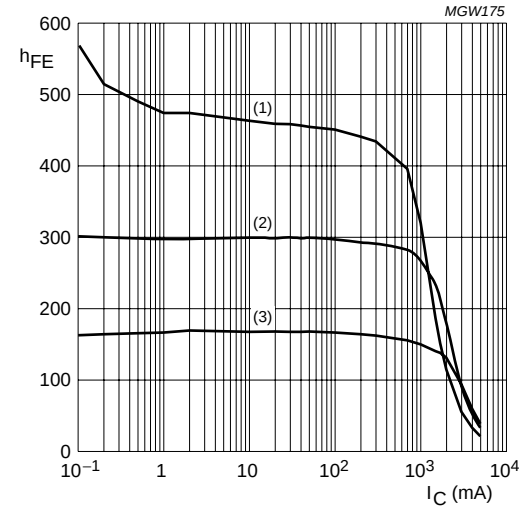
CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_{CBO}	collector-base cut-off current	V_{CB} = 50 V; I_E = 0	–	–	100	nA
		V_{CB} = 50 V; I_E = 0; T_j = 150 °C	–	–	50	μA
I_{EBO}	emitter-base cut-off current	V_{EB} = 5 V; I_C = 0	–	–	100	nA
h_{FE}	DC current gain	V_{CE} = 2 V; I_C = 500 mA	200	–	–	
		V_{CE} = 2 V; I_C = 1 A; note 1	200	–	–	
		V_{CE} = 2 V; I_C = 2 A; note 1	100	–	–	
V_{CEsat}	collector -emitter saturation voltage	I_C = 500 mA; I_B = 50 mA	–	–	90	mV
		I_C = 1 A; I_B = 50 mA	–	–	170	mV
		I_C = 2 A; I_B = 200 mA; note 1	–	–	290	mV
R_{CEsat}	equivalent on-resistance	I_C = 2 A; I_B = 200 mA; note 1	–	110	<145	mΩ
V_{BEsat}	base-emitter saturation voltage	I_C = 2 A; I_B = 200 mA; note 1	–	–	1.2	V
V_{BEon}	base-emitter turn-on voltage	V_{CE} = 2 V; I_C = 1 A; note 1	–	–	1.1	V
f_T	transition frequency	I_C = 100 mA; V_{CE} = 5 V; f = 100 MHz	100	–	–	MHz
C_c	collector capacitance	V_{CB} = 10 V; I_E = I_e = 0; f = 1 MHz	–	–	30	pF

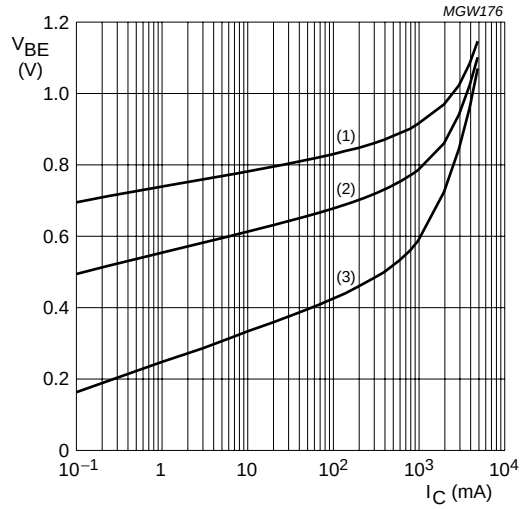
Note

1. Pulse test: $t_p \leq 300$ μs; $\delta \leq 0.02$.



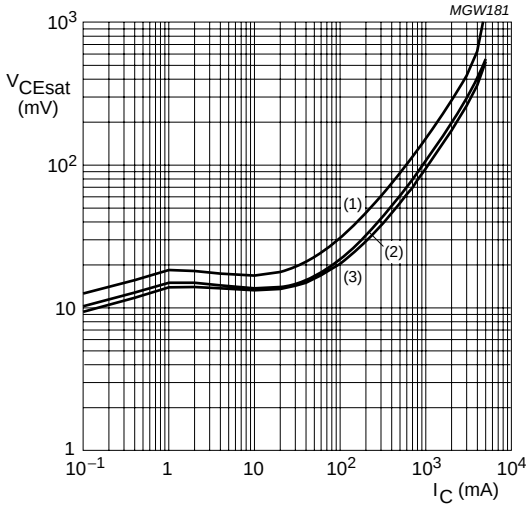
V_{CE} = 2 V.
(1) T_{amb} = 150 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = −55 °C.

Fig.2 DC current gain; typical values.



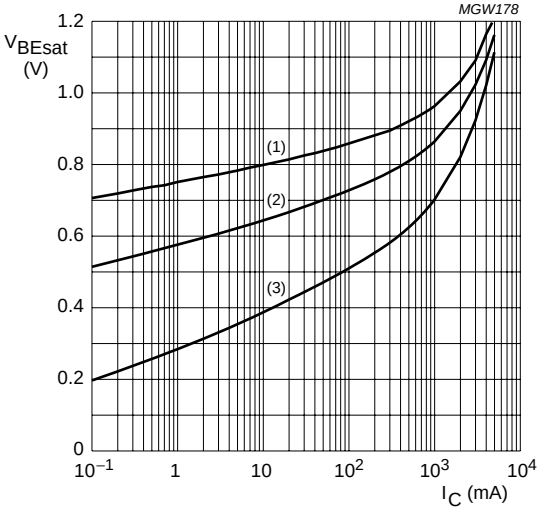
V_{CE} = 2 V.
(1) T_{amb} = −55 °C.
(2) T_{amb} = 25 C.
(3) T_{amb} = 150 °C.

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



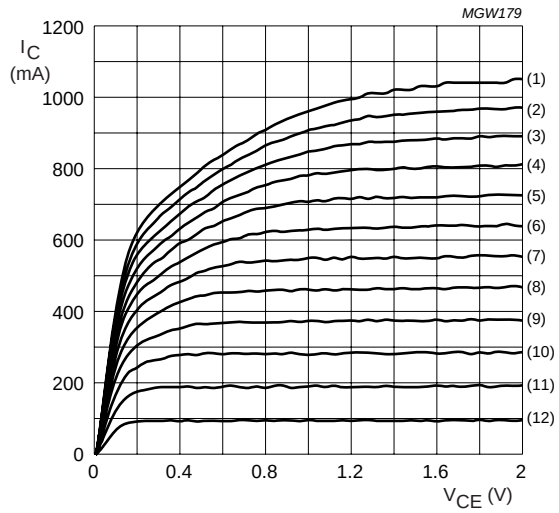
I_C/I_B = 20.
(1) T_{amb} = 150 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = −55 °C.

Fig.4 Collector-emitter saturation 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.

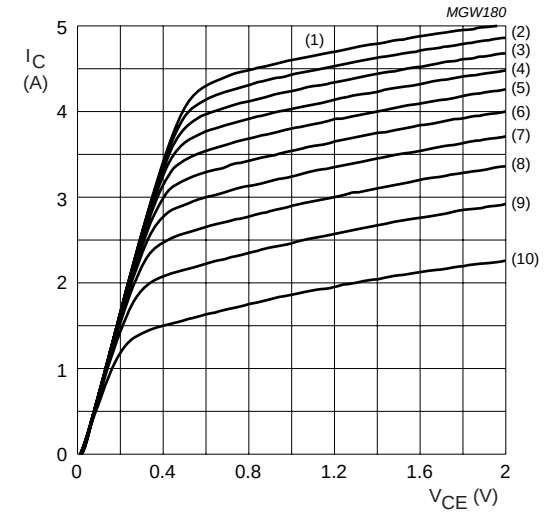
Fig.5 Base-emitter saturation voltage as a function of collector current; typical values.



V_{CE} = 5 V.

(1) I_B = 3.96 nA.
(2) I_B = 3.63 nA.
(3) I_B = 3.30 nA.
(4) I_B = 2.97 mA.
(5) I_B = 2.64 nA.
(6) I_B = 2.31 nA.
(7) I_B = 1.98 nA.
(8) I_B = 1.65 nA.
(9) I_B = 1.32 nA.
(10) I_B = 0.99 nA.
(11) I_B = 0.66 nA.
(12) I_B = 0.33 nA.

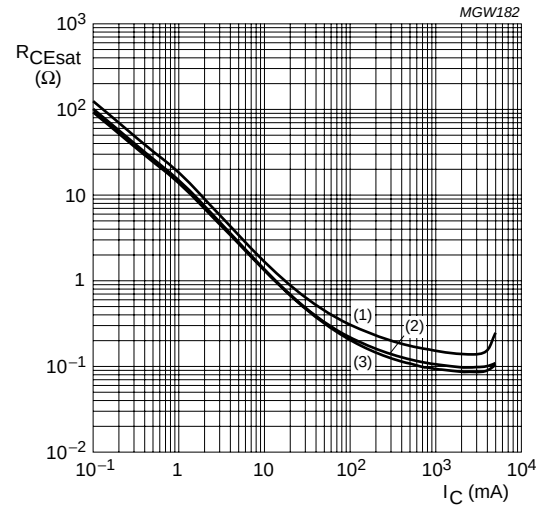
Fig.6 Collector current as a function of collector-emitter voltage; typical values.



V_{CE} = 5 V.

(1) I_B = 150 mA.
(2) I_B = 135 mA.
(3) I_B = 120 mA.
(4) I_B = 105 mA.
(5) I_B = 90 mA.
(6) I_B = 75 mA.
(7) I_B = 60 mA.
(8) I_B = 45 mA.
(9) I_B = 30 mA.
(10) I_B = 15 mA.

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



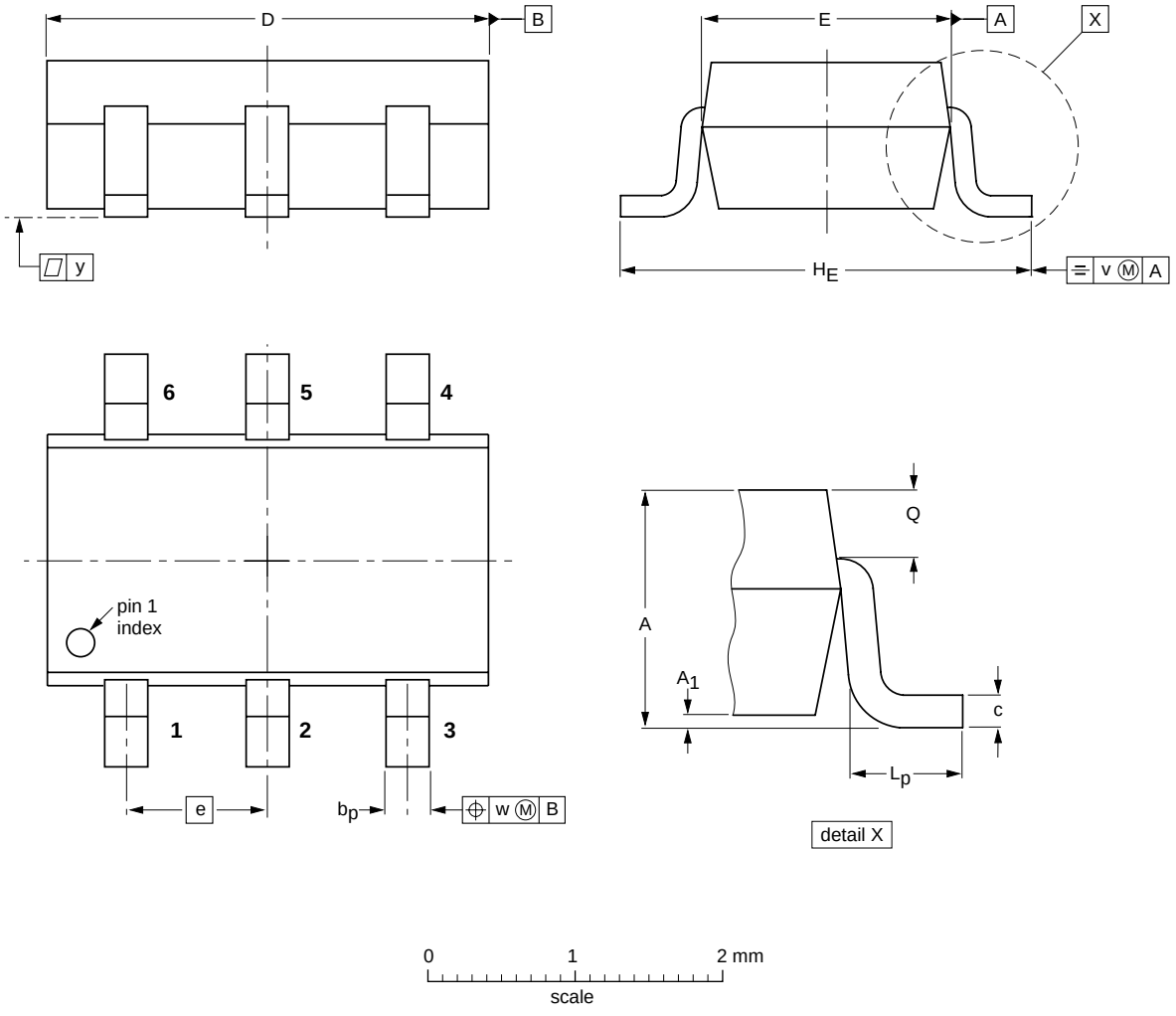
I_C/I_B = 20.

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

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

PACKAGE OUTLINE

Plastic surface mounted package; 6 leads **SOT457**



DIMENSIONS (mm are the original dimensions)

UNIT	A	A_1	b_p	c	D	E	e	H_E	L_p	Q	v	w	y
mm	1.1 0.9	0.1 0.013	0.40 0.25	0.26 0.10	3.1 2.7	1.7 1.3	0.95	3.0 2.5	0.6 0.2	0.33 0.23	0.2	0.2	0.1

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT457			SC-74			~~97-02-28~~ 01-05-04

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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Printed in The Netherlands 613514/03/pp9 Date of release: 2001 Jul 13 Document order number: 9397 750 08426

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