DISCRETE SEMICONDUCTORS

DATA SHEET

BC849; BC850

NPN general purpose transistors

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NPN general purpose transistors   BC849; BC850

FEATURES

- Low current (max. 100 mA)
- Low voltage (max. 45 V).

APPLICATIONS

- General purpose switching and amplification.

DESCRIPTION

NPN transistor in a SOT23 plastic package.
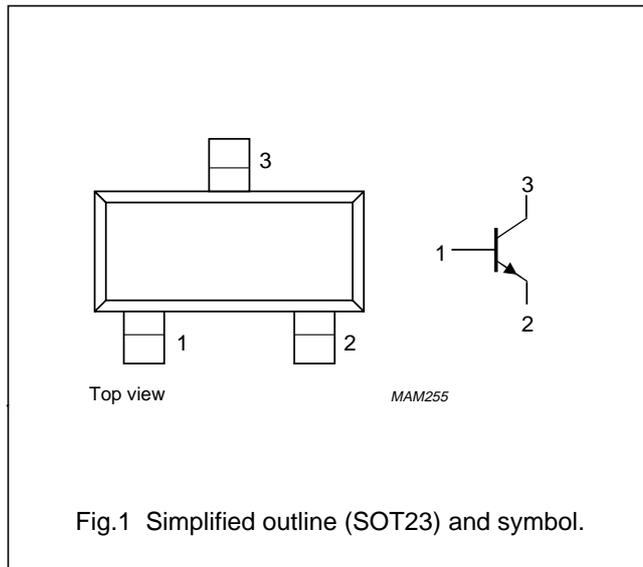PNP complements: BC859 and BC860.

MARKING

TYPE NUMBER	MARKING CODE[1]	TYPE NUMBER	MARKING CODE[1]
BC849B	2B*	BC850B	2F*
BC849C	2C*	BC850C	2G*

Note

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

PINNING

PIN	DESCRIPTION
1	base
2	emitter
3	collector

Fig.1 Simplified outline (SOT23) and symbol.

ORDERING INFORMATION

TYPE NUMBER	PACKAGE		
	NAME	DESCRIPTION	VERSION
BC849B	–	plastic surface mounted package; 3 leads	SOT23
BC849C			
BC850B			
BC850C			

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			
	BC849		–	30	V
	BC850		–	50	V
V_{CEO}	collector-emitter voltage	open base			
	BC849		–	30	V
	BC850		–	45	V
V_{EBO}	emitter-base voltage	open collector	–	5	V
I_C	collector current (DC)		–	100	mA
I_{CM}	peak collector current		–	200	mA
I_{BM}	peak base current		–	200	mA
P_{tot}	total power dissipation	$T_{amb} \leq 25\ °C$; note 1	–	250	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C
T_{amb}	operating ambient temperature		–65	+150	°C

Note

1. Transistor mounted on an FR4 printed-circuit board.

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th(j-a)}$	thermal resistance from junction to ambient	note 1	500	K/W

Note

1. Transistor mounted on an FR4 printed-circuit board.

CHARACTERISTICS

T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_{CBO}	collector cut-off current	$I_E = 0$; $V_{CB} = 30$ V	–	–	15	nA
		$I_E = 0$; $V_{CB} = 30$ V; $T_j = 150$ °C	–	–	5	μA
I_{EBO}	emitter cut-off current	$I_C = 0$; $V_{EB} = 5$ V	–	–	100	nA

h_{FE}	DC current gain
	  BC849B; BC850B
	  BC849C; BC850C
		$I_C = 10$ μA; $V_{CE} = 5$ V;
		see Figs 2 and 3
			–
			–
				240
				450
					–
					–	

	DC current gain
	  BC849B; BC850B
	  BC849C; BC850C
		$I_C = 2$ mA; $V_{CE} = 5$ V;
		see Figs 2 and 3
			200
			420
				290
				520
					450
					800	

V_{CEsat}	collector-emitter saturation voltage	$I_C = 10$ mA; $I_B = 0.5$ mA	–	90	250	mV
		$I_C = 100$ mA; $I_B = 5$ mA	–	200	600	mV
V_{BEsat}	base-emitter saturation voltage	$I_C = 10$ mA; $I_B = 0.5$ mA; note 1	–	700	–	mV
		$I_C = 100$ mA; $I_B = 5$ mA; note 1	–	900	–	mV
V_{BE}	base-emitter voltage	$I_C = 2$ mA; $V_{CE} = 5$ V; note 2	580	660	700	mV
		$I_C = 10$ mA; $V_{CE} = 5$ V; note 2	–	–	770	mV
C_c	collector capacitance	$I_E = i_e = 0$; $V_{CB} = 10$ V; $f = 1$ MHz	–	2.5	–	pF
C_e	emitter capacitance	$I_C = i_c = 0$; $V_{EB} = 500$ mV; $f = 1$ MHz	–	11	–	pF
f_T	transition frequency	$I_C = 10$ mA; $V_{CE} = 5$ V; $f = 100$ MHz	100	–	–	MHz
F	noise figure	$I_C = 200$ μA; $V_{CE} = 5$ V; $R_S = 2$ kΩ; $f = 10$ Hz to 15.7 kHz	–	–	4	dB
		$I_C = 200$ μA; $V_{CE} = 5$ V; $R_S = 2$ kΩ; $f = 1$ kHz; B = 200 Hz	–	–	4	dB

Notes

1. V_{BEsat} decreases by about 1.7 mV/K with increasing temperature.

2. V_{BE} decreases by about 2 mV/K with increasing temperature.
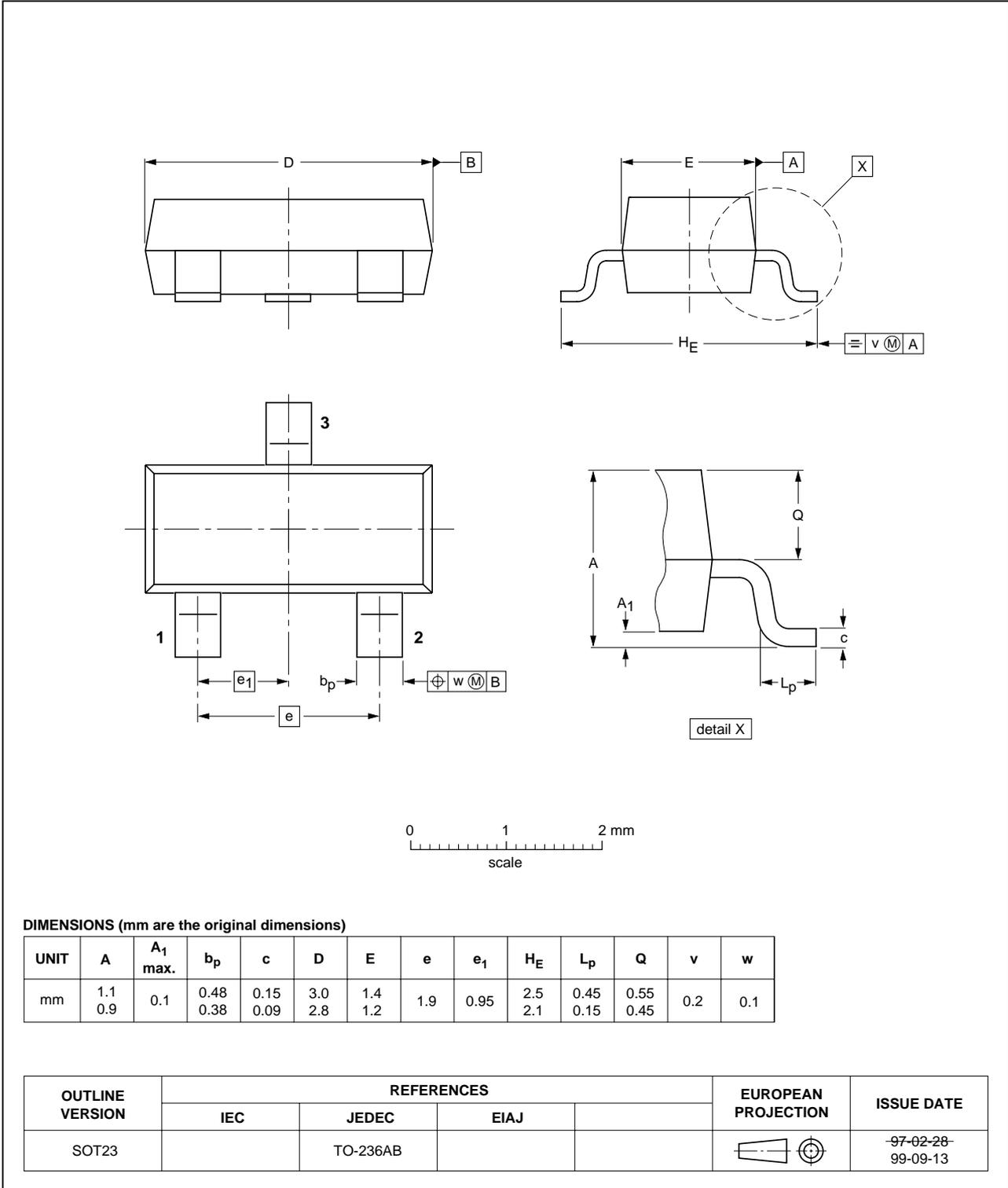
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BC849B; BC850B.

Fig.2 DC current gain; typical values.

BC849C; BC850C.

Fig.3 DC current gain; typical values.
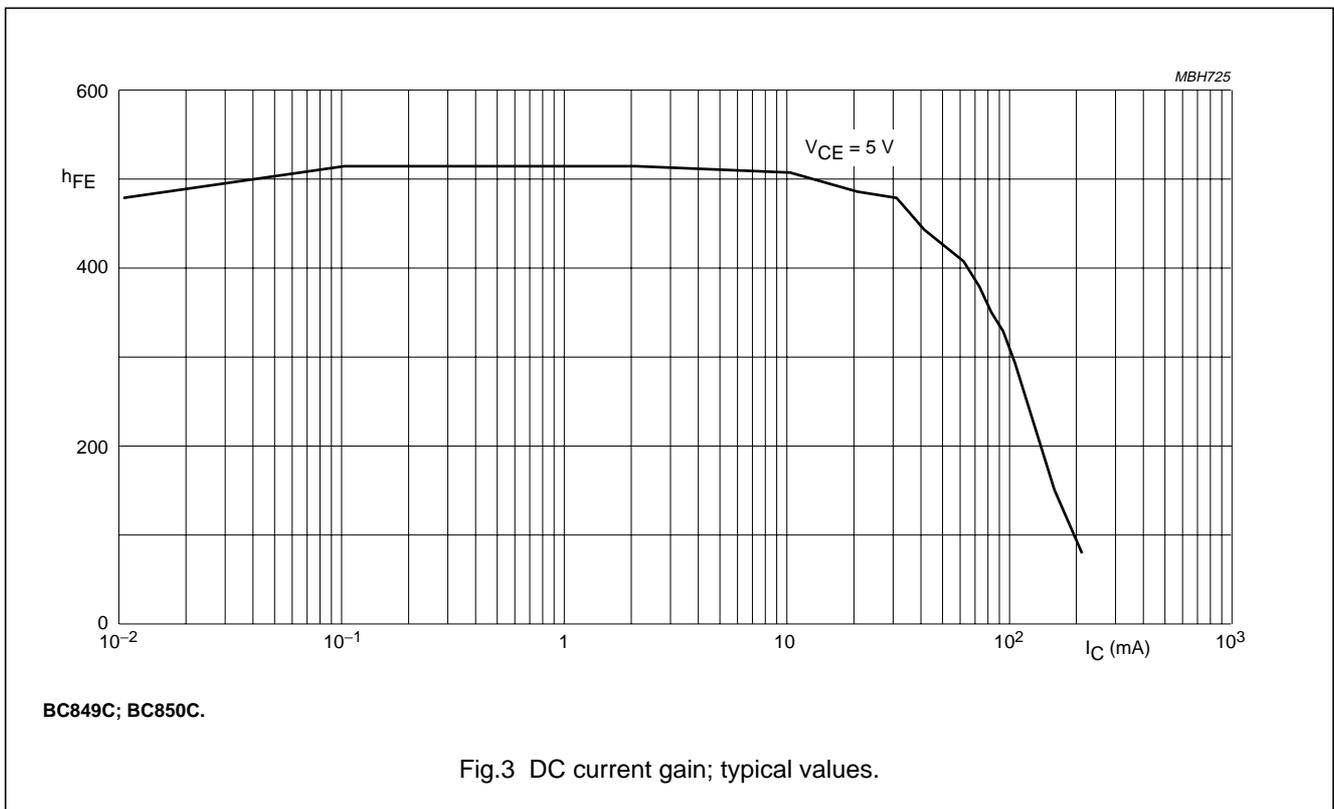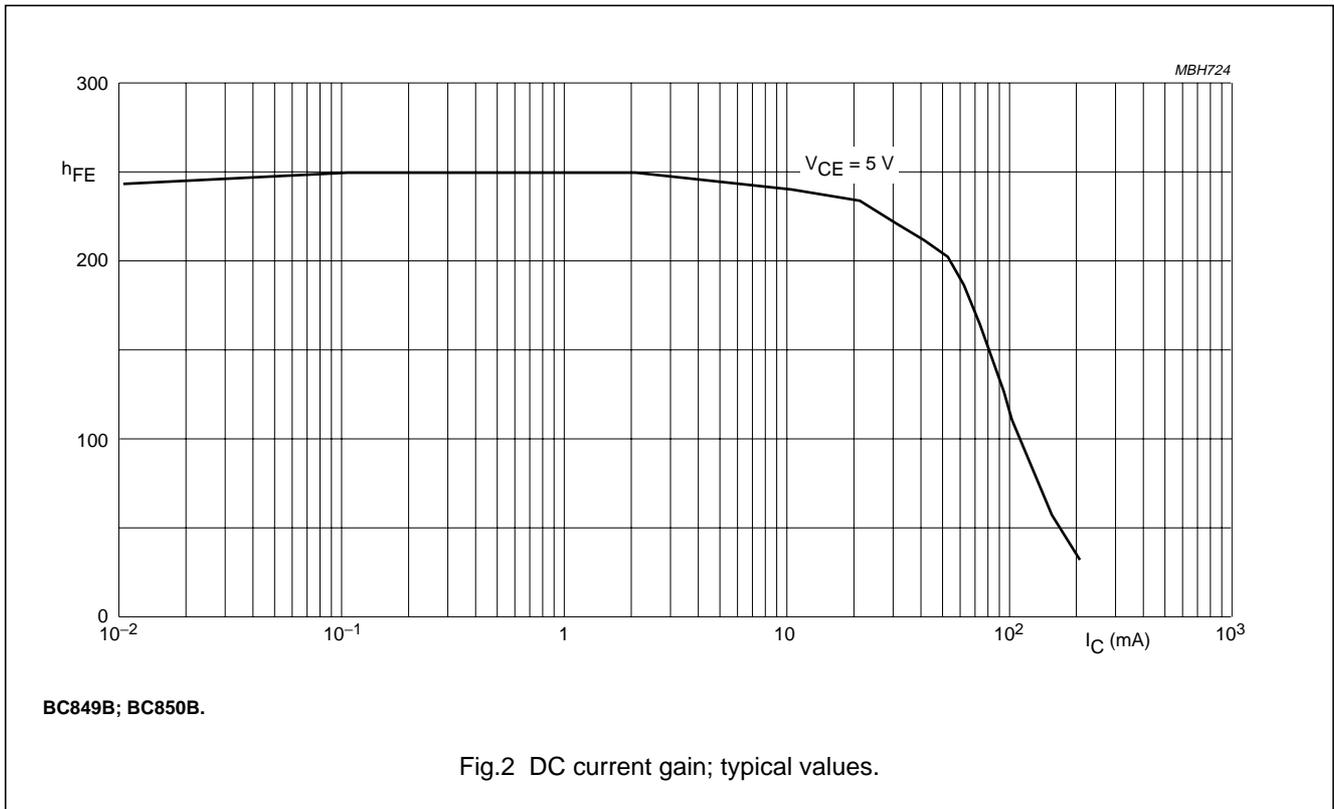
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PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT23

0   1   2 mm
scale

DIMENSIONS (mm are the original dimensions)

UNIT	A	A₁ max.	b_p	c	D	E	e	e₁	H_E	L_p	Q	v	w
mm	1.1 0.9	0.1	0.48 0.38	0.15 0.09	3.0 2.8	1.4 1.2	1.9	0.95	2.5 2.1	0.45 0.15	0.55 0.45	0.2	0.1

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT23		TO-236AB				97-02-28 99-09-13

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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.
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Notes

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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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