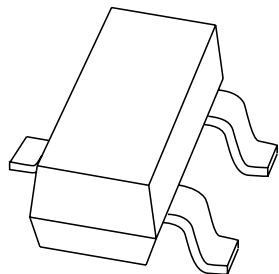


# DATA SHEET



## BC859; BC860 PNP general purpose transistors

Product specification  
Supersedes data of 1999 May 28

2004 Jan 16

## PNP general purpose transistors

BC859; BC860

## FEATURES

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

## APPLICATIONS

- Low noise input stages of audio frequency equipment.

## DESCRIPTION

PNP transistor in a SOT23 plastic package.  
NPN complements: BC849 and BC850.

## MARKING

TYPE NUMBER	MARKING CODE <sup>(1)</sup>	TYPE NUMBER	MARKING CODE <sup>(1)</sup>
BC859B	4B*	BC860B	4F*
BC859C	4C*	BC860C	4G*

## Note

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

## ORDERING INFORMATION

TYPE NUMBER	PACKAGE		
	NAME	DESCRIPTION	VERSION
BC859B	—	plastic surface mounted package; 3 leads	SOT23
BC859C			
BC860B			
BC860C			

## PINNING

PIN	DESCRIPTION
1	base
2	emitter
3	collector

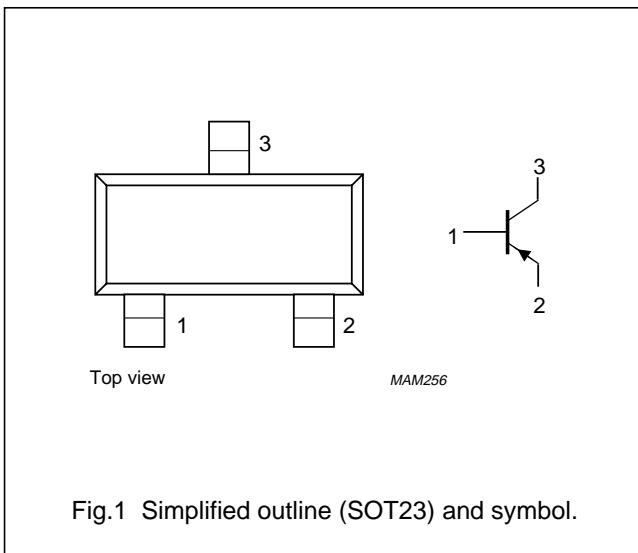


Fig.1 Simplified outline (SOT23) and symbol.

## PNP general purpose transistors

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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 BC859 BC860	open emitter	– –	–30 –50	V V
$V_{CEO}$	collector-emitter voltage BC859 BC860	open base	– –	–30 –45	V 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	$T_{amb} \leq 25^\circ\text{C}$ ; 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.

## PNP general purpose transistors

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## CHARACTERISTICS

 $T_j = 25^\circ\text{C}$  unless otherwise specified.

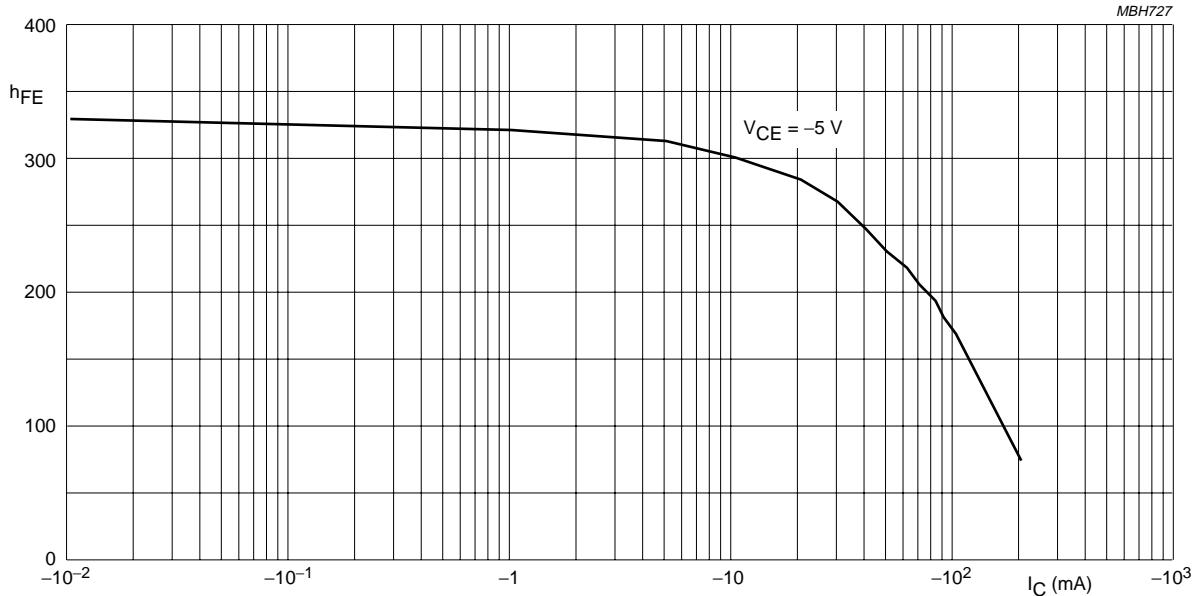
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$I_{CBO}$	collector cut-off current	$I_E = 0; V_{CB} = -30\text{ V}$	—	—1	—15	nA
		$I_E = 0; V_{CB} = -30\text{ V}; T_j = 150^\circ\text{C}$	—	—	—4	$\mu\text{A}$
$I_{EBO}$	emitter cut-off current	$I_C = 0; V_{EB} = -5\text{ V}$	—	—	—100	nA
$h_{FE}$	DC current gain BC859B; BC860B BC859C; BC860C	$I_C = -2\text{ mA}; V_{CE} = -5\text{ V};$ see Figs 2 and 3	220	—	475	
			420	—	800	
$V_{CEsat}$	collector-emitter saturation voltage	$I_C = -10\text{ mA}; I_B = -0.5\text{ mA}$	—	—75	—300	mV
		$I_C = -100\text{ mA}; I_B = -5\text{ mA}$	—	—250	—650	mV
$V_{BEsat}$	base-emitter saturation voltage	$I_C = -10\text{ mA}; I_B = -0.5\text{ mA}; \text{note 1}$	—	—700	—	mV
		$I_C = -100\text{ mA}; I_B = -5\text{ mA}; \text{note 1}$	—	—850	—	mV
$V_{BE}$	base-emitter voltage	$I_C = -2\text{ mA}; V_{CE} = -5\text{ V}; \text{note 2}$	—600	—650	—750	mV
		$I_C = -10\text{ mA}; V_{CE} = -5\text{ V}; \text{note 2}$	—	—	—820	mV
$C_c$	collector capacitance	$I_E = I_e = 0; V_{CB} = -10\text{ V}; f = 1\text{ MHz}$	—	4.5	—	pF
$C_e$	emitter capacitance	$I_C = I_e = 0; V_{EB} = -500\text{ mV}; f = 1\text{ MHz}$	—	10	—	pF
$f_T$	transition frequency	$I_C = -10\text{ mA}; V_{CE} = -5\text{ V}; f = 100\text{ MHz}$	100	—	—	MHz
$F$	noise figure BC859B; BC860B; BC859C; BC860C	$I_C = -200\text{ }\mu\text{A}; V_{CE} = -5\text{ V}; R_S = 2\text{ k}\Omega;$ $f = 30\text{ Hz to }15\text{ kHz}$	—	—	4	dB
	noise figure BC859B; BC860B; BC859C; BC860C	$I_C = -200\text{ }\mu\text{A}; V_{CE} = -5\text{ V}; R_S = 2\text{ k}\Omega;$ $f = 1\text{ kHz}; B = 200\text{ Hz}$	—	—	4	dB

## Notes

- $V_{BEsat}$  decreases by about  $-1.7\text{ mV/K}$  with increasing temperature.
- $V_{BE}$  decreases by about  $-2\text{ mV/K}$  with increasing temperature.

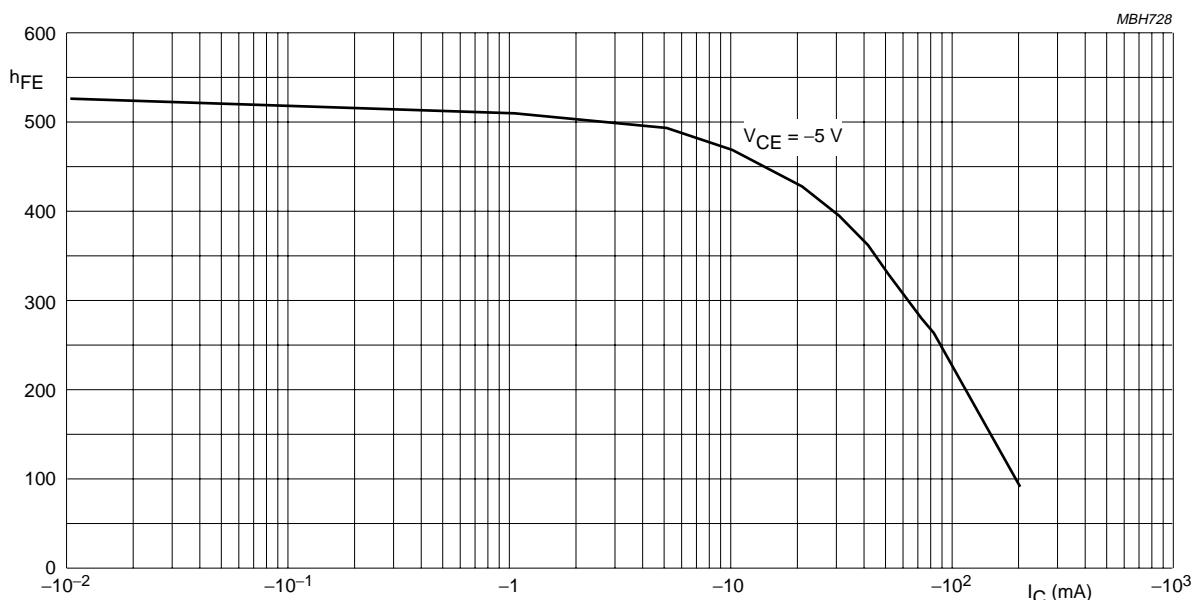
## PNP general purpose transistors

BC859; BC860



BC859B; BC860B.

Fig.2 DC current gain; typical values.



BC859C; BC860C.

Fig.3 DC current gain; typical values.

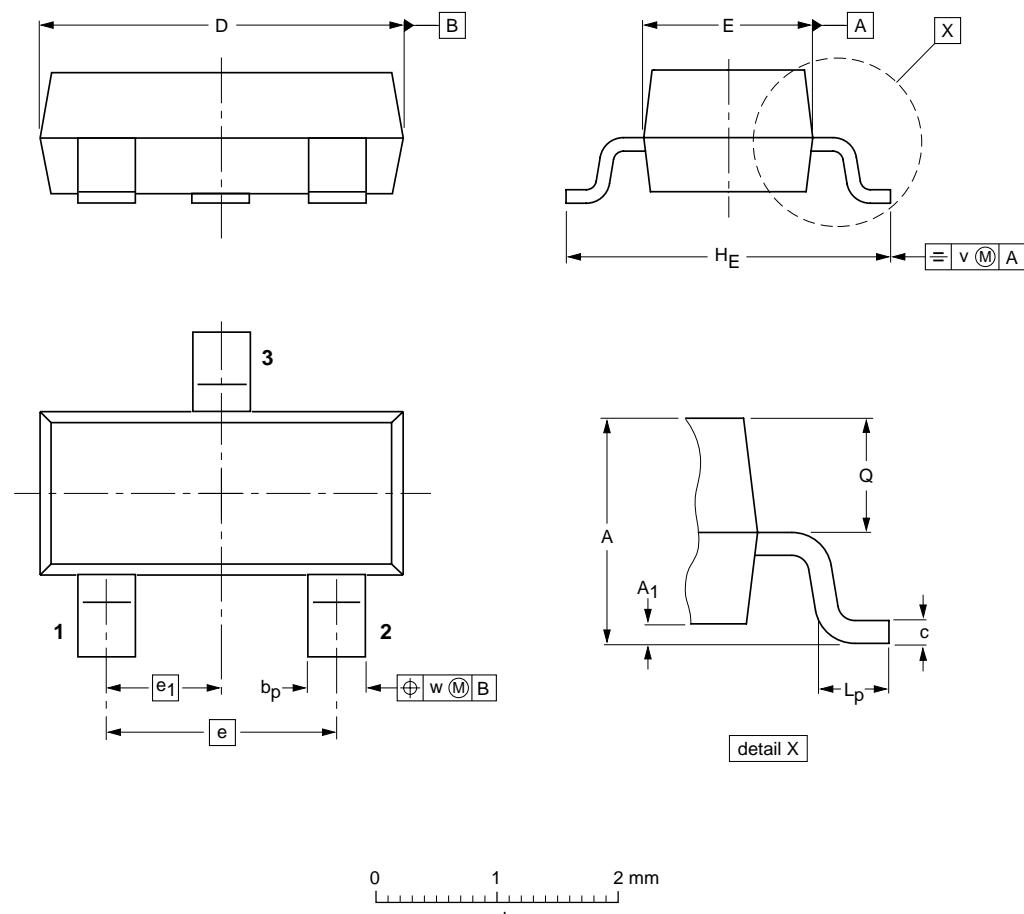
## PNP general purpose transistors

BC859; BC860

## PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT23



## DIMENSIONS (mm are the original dimensions)

UNIT	A	A <sub>1</sub> max.	b <sub>p</sub>	c	D	E	e	e <sub>1</sub>	H <sub>E</sub>	l <sub>p</sub>	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

## PNP general purpose transistors

BC859; BC860

## DATA SHEET STATUS

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