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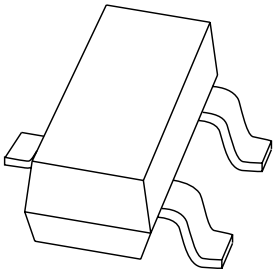
Team Nexperia

DATA SHEET



BC859; BC860
PNP general purpose transistors

Product data sheet
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(1)	TYPE NUMBER	MARKING CODE(1)
BC859B	4B*	BC860B	4F*
BC859C	4C*	BC860C	4G*

Note

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

PINNING

PIN	DESCRIPTION
1	base
2	emitter
3	collector

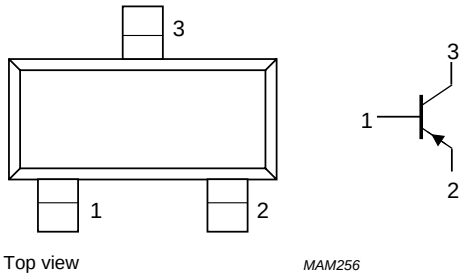


Fig.1 Simplified outline (SOT23) and symbol.

ORDERING INFORMATION

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

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			
	BC859		−	−30	V
	BC860		−	−50	V
V_{CEO}	collector-emitter voltage	open base			
	BC859		−	−30	V
	BC860		−	−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.

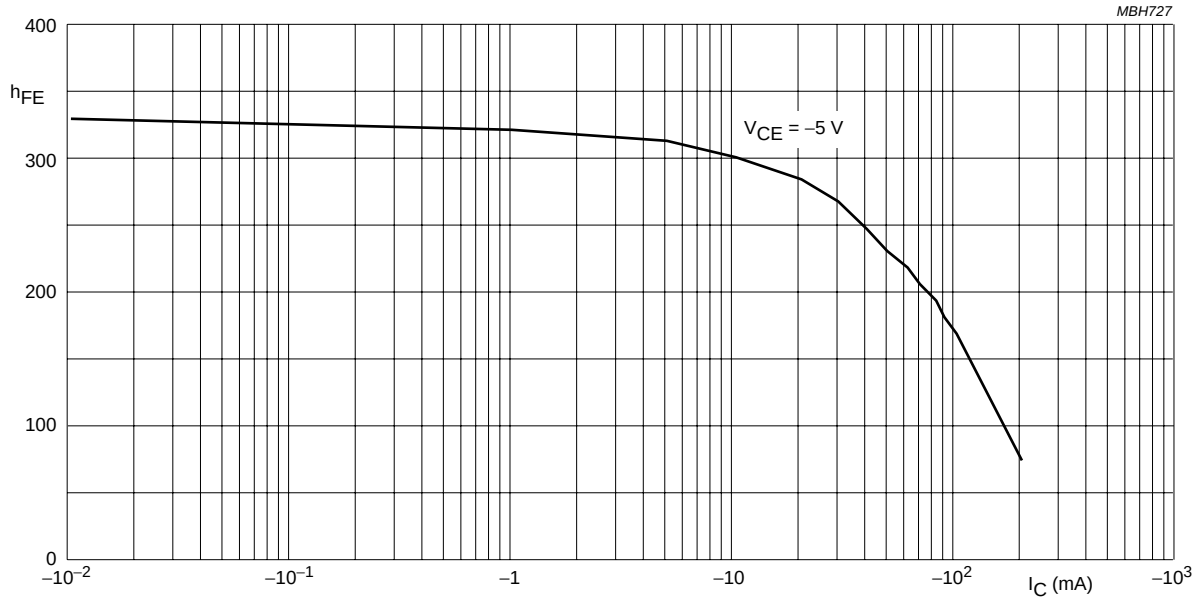
CHARACTERISTICS

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	−	−1	−15	nA
		I_E = 0; V_{CB} = −30 V; T_j = 150 °C	−	−	−4	μA
I_{EBO}	emitter cut-off current	I_C = 0; V_{EB} = −5 V	−	−	−100	nA
h_{FE}	DC current gain BC859B; BC860B BC859C; BC860C	I_C = −2 mA; V_{CE} = −5 V; see Figs 2 and 3	 220 420	 − −	 475 800	
V_{CEsat}	collector-emitter saturation voltage	I_C = −10 mA; I_B = −0.5 mA	−	−75	−300	mV
		I_C = −100 mA; I_B = −5 mA	−	−250	−650	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	−	−850	−	mV
V_{BE}	base-emitter voltage	I_C = −2 mA; V_{CE} = −5 V; note 2	−600	−650	−750	mV
		I_C = −10 mA; V_{CE} = −5 V; note 2	−	−	−820	mV
C_c	collector capacitance	I_E = I_e = 0; V_{CB} = −10 V; f = 1 MHz	−	4.5	−	pF
C_e	emitter capacitance	I_C = I_c = 0; V_{EB} = −500 mV; f = 1 MHz	−	10	−	pF
f_T	transition frequency	I_C = −10 mA; V_{CE} = −5 V; f = 100 MHz	100	−	−	MHz
F	noise figure BC859B; BC860B; BC859C; BC860C	I_C = −200 μA; V_{CE} = −5 V; R_S = 2 kΩ; f = 30 Hz to 15 kHz	−	−	4	dB
	noise figure BC859B; BC860B; BC859C; BC860C	I_C = −200 μA; V_{CE} = −5 V; R_S = 2 kΩ; f = 1 kHz; B = 200 Hz	−	−	4	dB

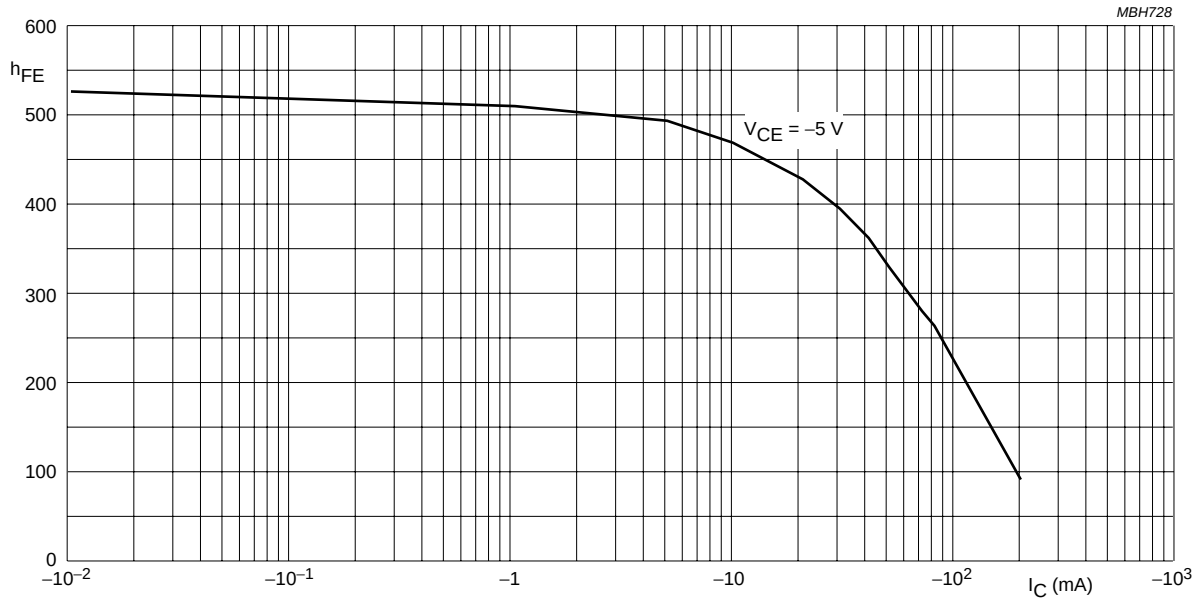
Notes

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.



BC859B; BC860B.

Fig.2 DC current gain; typical values.

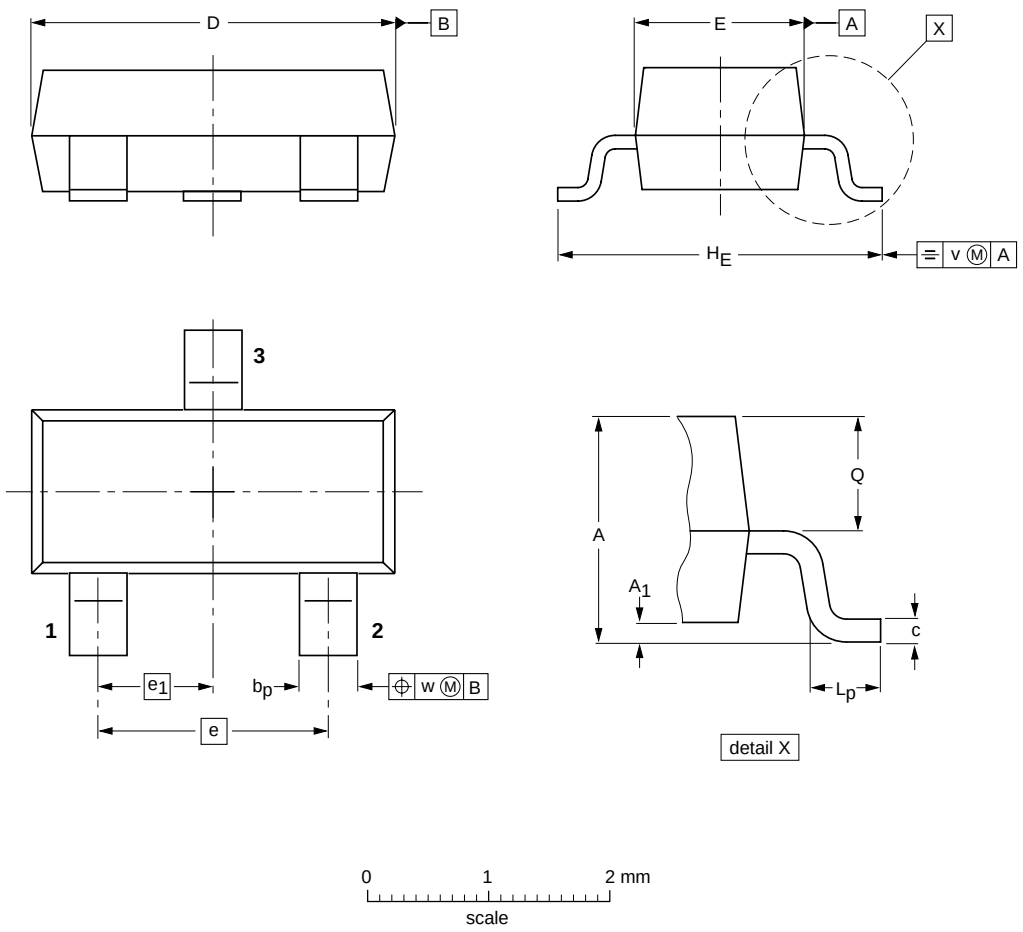


BC859C; BC860C.

Fig.3 DC current gain; typical values.

PACKAGE OUTLINE

Plastic surface-mounted package; 3 leads **SOT23**



DIMENSIONS (mm are the original dimensions)

UNIT	A	A_1 max.	b_p	c	D	E	e	e_1	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	JEITA			
SOT23		TO-236AB				~~04-11-04~~ 06-03-16

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.

Notes

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NXP Semiconductors

Customer notification

This data sheet was changed to reflect the new company name NXP Semiconductors, including new legal definitions and disclaimers. No changes were made to the technical content, except for package outline drawings which were updated to the latest version.

Contact information

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