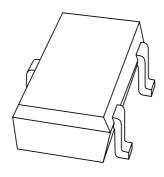
## **DISCRETE SEMICONDUCTORS**

# DATA SHEET



## BC859W; BC860W PNP general purpose transistors

Product data sheet Supersedes data of 1997 Sep 03 1999 Apr 12



## **PNP** general purpose transistors

BC859W; BC860W

#### **FEATURES**

• Low current (max. 100 mA)

• Low voltage (max. 45 V).

#### **APPLICATIONS**

• Low noise stages in tape recorders, hi-fi amplifiers and other audio-frequency equipment.

#### **DESCRIPTION**

PNP transistor in a SOT323 plastic package. NPN complements: BC849W and BC850W.

#### **MARKING**

TYPE NUMBER	MARKING TYPE R CODE NUMBER		MARKING CODE	
BC859W	4D*	BC860W	4H*	
BC859BW	4B*	BC860BW	4F*	
BC859CW	4C*	BC860CW	4G*	

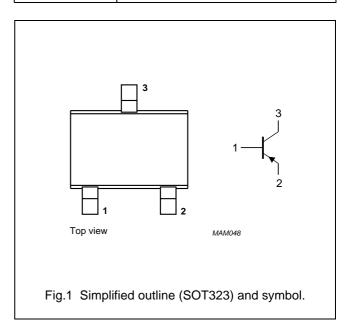
#### Note

1. \* = -: Made in Hong Kong.

\* = t : Made in Malaysia.

#### **PINNING**

PIN	DESCRIPTION	
1	base	
2	emitter	
3	collector	



#### LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V <sub>CBO</sub>	collector-base voltage	open emitter			
	BC859W		_	-30	V
	BC860W		_	-50	V
V <sub>CEO</sub>	collector-emitter voltage	open base			
	BC859W		_	-30	V
	BC860W		_	-45	V
$V_{EBO}$	emitter-base voltage	open collector	_	<b>-5</b>	V
I <sub>C</sub>	collector current (DC)		_	-100	mA
I <sub>CM</sub>	peak collector current		_	-200	mA
I <sub>BM</sub>	peak base current		_	-200	mA
P <sub>tot</sub>	total power dissipation	T <sub>amb</sub> ≤ 25 °C; note 1	_	200	mW
T <sub>stg</sub>	storage temperature		-65	+150	°C
Tj	junction temperature		_	150	°C
T <sub>amb</sub>	operating ambient temperature		-65	+150	°C

#### Note

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

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## PNP general purpose transistors

BC859W; BC860W

#### THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
R <sub>th j-a</sub>	thermal resistance from junction to ambient	note 1	625	K/W

#### Note

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

#### **CHARACTERISTICS**

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I <sub>CBO</sub>	collector cut-off current	I <sub>E</sub> = 0; V <sub>CB</sub> = -30 V	_	_	-15	nA
		$I_E = 0$ ; $V_{CB} = -30 \text{ V}$ ; $T_j = 150 ^{\circ}\text{C}$	_	_	-4	μΑ
I <sub>EBO</sub>	emitter cut-off current	$I_C = 0; V_{EB} = -5 \text{ V}$	_	_	-100	nA
h <sub>FE</sub>	DC current gain	$I_C = -2 \text{ mA}; V_{CE} = -5 \text{ V};$				
	BC859W; BC860W	see Figs 2 and 3	220	_	800	
	BC859BW; BC860BW		220	_	475	
	BC859CW; BC860CW		420	_	800	
V <sub>CEsat</sub>	collector-emitter saturation	$I_C = -10 \text{ mA}; I_B = -0.5 \text{ mA}$	_	_	-300	mV
	voltage	$I_C = -100 \text{ mA}$ ; $I_B = -5 \text{ mA}$ ; note 1	_	_	-650	mV
V <sub>BE</sub>	base-emitter voltage	$I_C = -2 \text{ mA}; V_{CE} = -5 \text{ V}$	600	_	750	mV
		$I_C = -10 \text{ mA}; V_{CE} = -5 \text{ V}$	_	_	820	mV
C <sub>c</sub>	collector capacitance	$I_E = i_e = 0$ ; $V_{CB} = -10 \text{ V}$ ; $f = 1 \text{ MHz}$	-	-	5	pF
C <sub>e</sub>	emitter capacitance	$I_C = I_c = 0$ ; $V_{EB} = -500 \text{ mV}$ ; $f = 1 \text{ MHz}$	-	10	_	pF
f <sub>T</sub>	transition frequency	$I_C = -10 \text{ mA}; V_{CE} = -5 \text{ V}; f = 100 \text{ MHz}$	100	_	_	MHz
F	noise figure; BC859W; BC860W;	$I_C$ = -200 μA; $V_{CE}$ = -5 V; $R_S$ = 2 kΩ; $f$ = 10 Hz to 15.7 kHz	_	-	4	dB
BC859BW; BC860BW; BC859CW; BC860CW		$\begin{split} I_C = -200 \; \mu\text{A}; \; V_{CE} = -5 \; V; \; R_S = 2 \; k\Omega; \\ f = 1 \; k\text{Hz}; \; B = 200 \; \text{Hz} \end{split}$	_	_	4	dB

#### Note

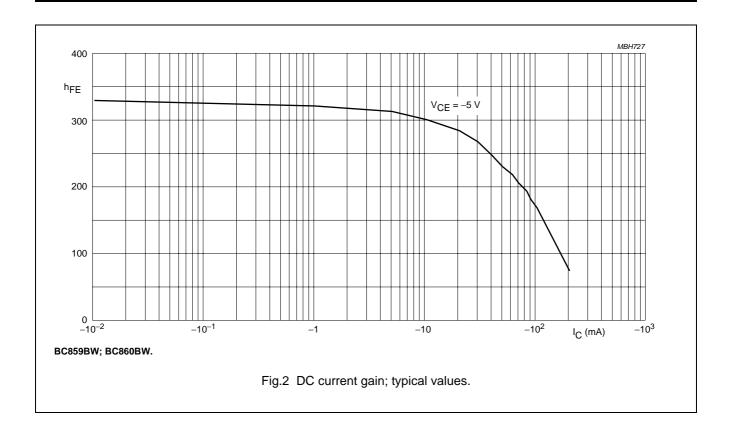
1. Pulse test:  $t_p \leq 300~\mu s;~\delta \leq 0.02.$ 

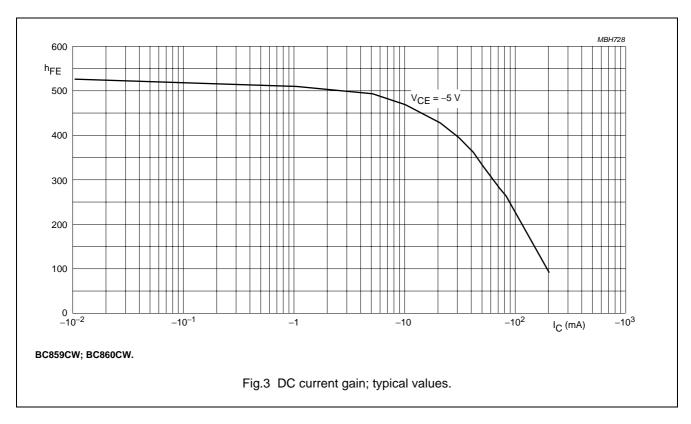
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## PNP general purpose transistors

BC859W; BC860W





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**NXP Semiconductors** Product data sheet

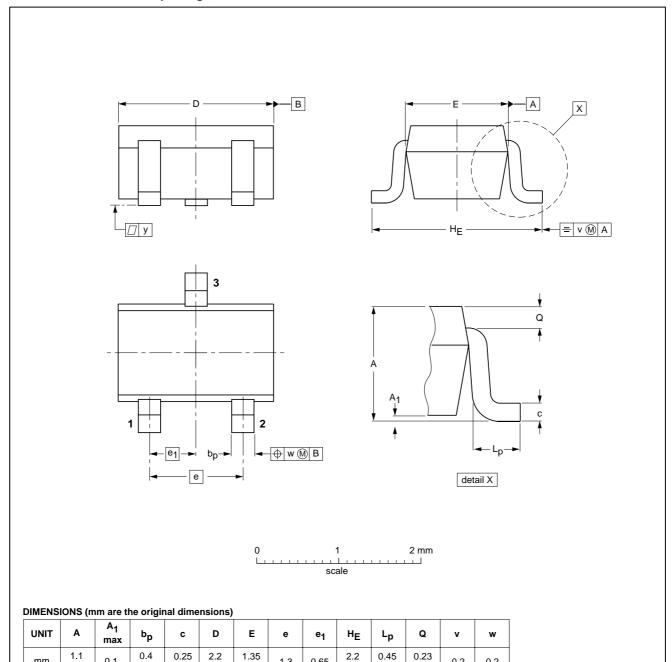
## PNP general purpose transistors

BC859W; BC860W

#### **PACKAGE OUTLINE**

Plastic surface mounted package; 3 leads

**SOT323** 



OUTLINE	REFERENCES		EUROPEAN	ISSUE DATE		
VERSION	IEC	JEDEC	EIAJ		PROJECTION	ISSUE DATE
SOT323			SC-70			97-02-28

0.2

1.3

0.65

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0.1

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### PNP general purpose transistors

BC859W; BC860W

#### **DATA SHEET STATUS**

DOCUMENT STATUS <sup>(1)</sup>	PRODUCT STATUS <sup>(2)</sup>	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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#### **Customer notification**

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#### **Contact information**

For additional information please visit: http://www.nxp.com

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