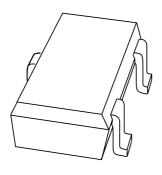
DISCRETE SEMICONDUCTORS

DATA SHEET



BC856W; BC857W; BC858W PNP general purpose transistors

Product specification Supersedes data of 1999 Apr 12 2002 Feb 04





PNP general purpose transistors

BC856W; BC857W; BC858W

FEATURES

• Low current (max. 100 mA)

• Low voltage (max. 65 V).

APPLICATIONS

• General purpose switching and amplification.

DESCRIPTION

PNP transistor in a SOT323 plastic package. NPN complements: BC846W, BC847W and BC848W.

MARKING

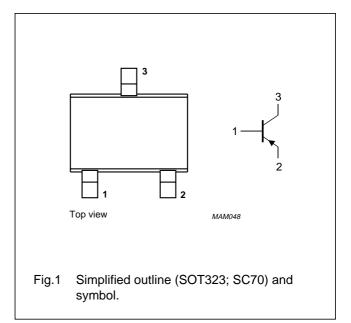
TYPE NUMBER	MARKING CODE(1)
BC856W	3D*
BC856AW	3A*
BC856BW	3B*
BC857W	3H*
BC857AW	3E*
BC857BW	3F*
BC857CW	3G*
BC858W	3M*

Note

1. * = -: made in Hong Kong.

PINNING

PIN	DESCRIPTION
1	base
2	emitter
3	collector



^{* =} t: made in Malaysia.

PNP general purpose transistors

BC856W; BC857W; BC858W

LIMITING VALUES

In accordance with the Absolute Maximum System (IEC 60134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{CBO}	collector-base voltage	open emitter			
	BC856W		_	-80	V
	BC857W		_	-50	V
	BC858W		_	-30	V
V_{CEO}	collector-emitter voltage	open base			
	BC856W		_	-65	V
	BC857W		_	-45	V
	BC858W		_	-30	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} ≤ 25 °C; note 1	_	200	mW
T _{stg}	storage temperature		-65	+150	°C
Tj	junction temperature		_	150	°C
T _{amb}	operating ambient temperature		-65	+150	°C

Note

THERMAL CHARACTERISTICS

SYMBOL	DL PARAMETER CONDITIONS		VALUE	UNIT
R _{th j-a}	thermal resistance from junction to ambient	in free air; note 1	625	K/W

Note

1. Refer to SOT323 standard mounting conditions.

^{1.} Refer to SOT323 standard mounting conditions.

PNP general purpose transistors

BC856W; BC857W; BC858W

CHARACTERISTICS

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

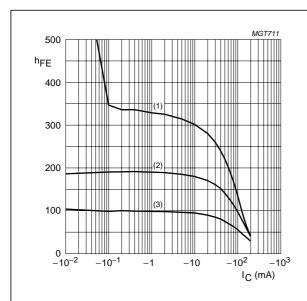
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I _{CBO}	collector-base cut-off current	$V_{CB} = -30 \text{ V}; I_E = 0$	_	-1	-15	nA
		$V_{CB} = -30 \text{ V}; I_{E} = 0;$ $T_{j} = 150 \text{ °C}$	_	-	-4	μΑ
I _{EBO}	emitter-base cut-off current	$V_{EB} = -5 \text{ V}; I_C = 0$	_	_	-100	nA
h _{FE}	DC current gain	$I_C = -2 \text{ mA}; V_{CE} = -5 \text{ V}$				
	BC856W		125	_	475	
	BC857W; BC858W		125	_	800	
	BC856AW; BC857AW		125	_	250	
	BC856BW; BC857BW		220	_	475	
	BC857CW		420	_	800	
V _{CEsat}	collector-emitter saturation voltage	$I_C = -10 \text{ mA}; I_B = -0.5 \text{ mA}$	_	-75	-300	mV
		$I_C = -100 \text{ mA}; I_B = -5 \text{ mA};$ note 1	_	-250	-600	mV
V _{BEsat}	base-emitter saturation voltage	$I_C = -10 \text{ mA}; I_B = -0.5 \text{ mA}$	_	-700	_	mV
		$I_C = -100 \text{ mA}; I_B = -5 \text{ mA};$ note 1	_	-850	_	mV
V _{BE}	base-emitter voltage	$I_C = -2 \text{ mA}; V_{CE} = -5 \text{ V}$	-600	-650	-750	mV
		$I_C = -10 \text{ mA}; V_{CE} = -5 \text{ V}$	_	_	-820	mV
C _c	collector capacitance	$V_{CB} = -10 \text{ V}; I_E = I_e = 0;$ f = 1 MHz	_	-	3	pF
C _e	emitter capacitance	$V_{EB} = -0.5 \text{ V}; I_{C} = I_{c} = 0;$ f = 1 MHz	_	-	12	pF
f _T	transition frequency	V _{CE} = -5 V; I _C = -10 mA; f = 100 MHz	100	_	_	MHz
F	noise figure	$I_{C} = -200 \mu A; V_{CE} = -5 V;$ $R_{S} = 2 k\Omega; f = 1 kHz;$ B = 200 Hz	_	_	10	dB

Note

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

PNP general purpose transistors

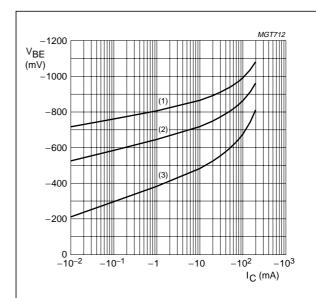
BC856W; BC857W; BC858W



BC857AW; $V_{CE} = -5 \text{ V}.$

- (1) $T_{amb} = 150 \, ^{\circ}C$.
- (2) $T_{amb} = 25 \, ^{\circ}C$.
- (3) $T_{amb} = -55 \, ^{\circ}C$.

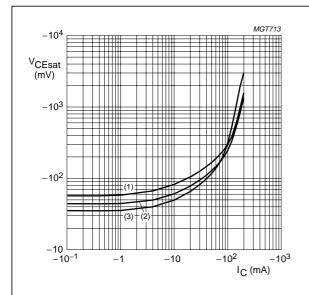
Fig.2 DC current gain as a function of collector current; typical values.



BC857AW; $V_{CE} = -5 \text{ V}.$

- (1) $T_{amb} = -55 \, ^{\circ}C$.
- (2) $T_{amb} = 25 \, ^{\circ}C$.
- (3) $T_{amb} = 150 \, ^{\circ}C$.

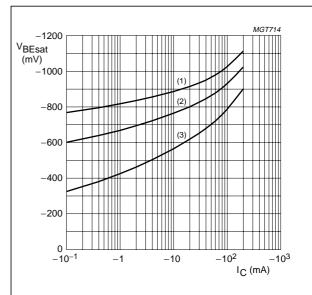
Fig.3 Base-emitter voltage as a function of collector current; typical values.



BC857AW; $I_{\text{C}}/I_{\text{B}} = 20$.

- (1) T_{amb} = 150 °C.
- (2) $T_{amb} = 25 \, ^{\circ}C$.
- (3) $T_{amb} = -55 \, ^{\circ}C$.

Fig.4 Collector-emitter saturation voltage as a function of collector current; typical values.



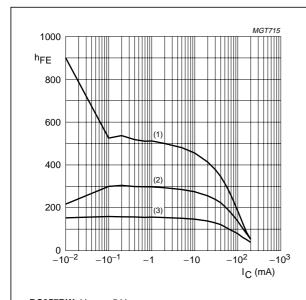
BC857AW; $I_C/I_B = 20$.

- (1) $T_{amb} = -55 \, ^{\circ}C$.
- (2) $T_{amb} = 25 \, ^{\circ}C$.
- (3) $T_{amb} = 150 \, ^{\circ}C$.

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

PNP general purpose transistors

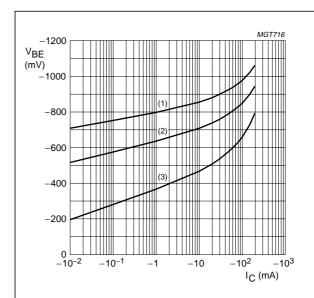
BC856W; BC857W; BC858W



BC857BW; $V_{CE} = -5 \text{ V}.$

- (1) $T_{amb} = 150 \, ^{\circ}C$.
- (2) $T_{amb} = 25 \, ^{\circ}C$.
- (3) $T_{amb} = -55 \, ^{\circ}C$.

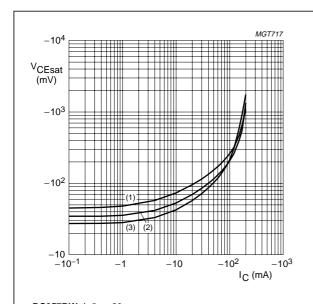
Fig.6 DC current gain as a function of collector current; typical values.



BC857BW; $V_{CE} = -5 \text{ V}$.

- (1) $T_{amb} = -55 \, ^{\circ}C$.
- (2) $T_{amb} = 25 \, ^{\circ}C$.
- (3) $T_{amb} = 150 \, ^{\circ}C$.

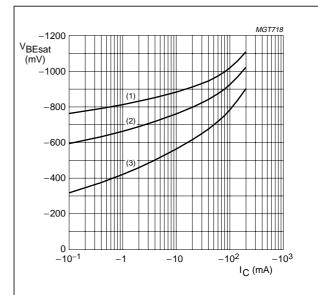
Fig.7 Base-emitter voltage as a function of collector current; typical values.



BC857BW; $I_C/I_B = 20$.

- (1) T_{amb} = 150 °C.
- (2) $T_{amb} = 25 \, ^{\circ}C$.
- (3) $T_{amb} = -55 \, ^{\circ}C$.

Fig.8 Collector-emitter saturation voltage as a function of collector current; typical values.



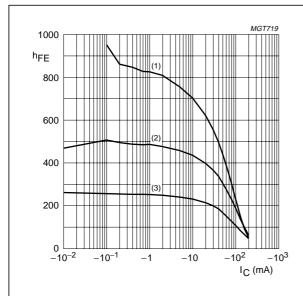
BC857BW; $I_C/I_B = 20$.

- (1) $T_{amb} = -55 \, ^{\circ}C$.
- (2) $T_{amb} = 25 \, ^{\circ}C$.
- (3) $T_{amb} = 150 \, ^{\circ}C$.

Fig.9 Base-emitter saturation voltage as a function of collector current; typical values.

PNP general purpose transistors

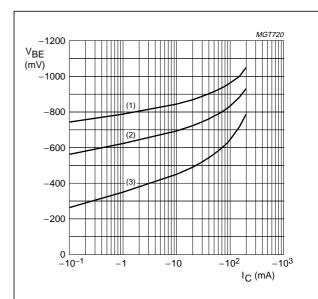
BC856W; BC857W; BC858W



BC857CW; $V_{CE} = -5 \text{ V}.$

- (1) $T_{amb} = 150 \, ^{\circ}C$.
- (2) $T_{amb} = 25 \, ^{\circ}C$.
- (3) $T_{amb} = -55 \, ^{\circ}C$.

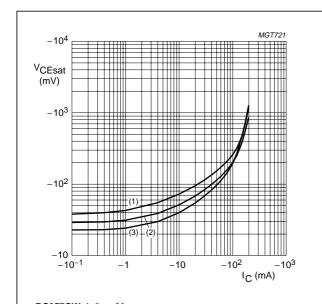
Fig.10 DC current gain as a function of collector current; typical values.



BC857CW; $V_{CE} = -5 \text{ V}.$

- (1) $T_{amb} = -55 \,^{\circ}C$.
- (2) $T_{amb} = 25 \, ^{\circ}C$.
- (3) $T_{amb} = 150 \, ^{\circ}C$.

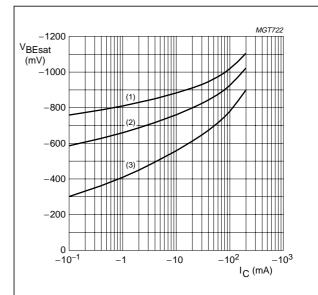
Fig.11 Base-emitter voltage as a function of collector current; typical values.



BC857CW; $I_C/I_B = 20$.

- (1) T_{amb} = 150 °C.
- (2) $T_{amb} = 25 \, ^{\circ}C$.
- (3) $T_{amb} = -55 \, ^{\circ}C$.

Fig.12 Collector-emitter saturation voltage as a function of collector current; typical values.



BC857CW; $I_C/I_B = 20$.

- (1) $T_{amb} = -55 \, ^{\circ}C$.
- (2) $T_{amb} = 25 \, ^{\circ}C$.
- (3) $T_{amb} = 150 \, ^{\circ}C$.

Fig.13 Base-emitter saturation voltage as a function of collector current; typical values.

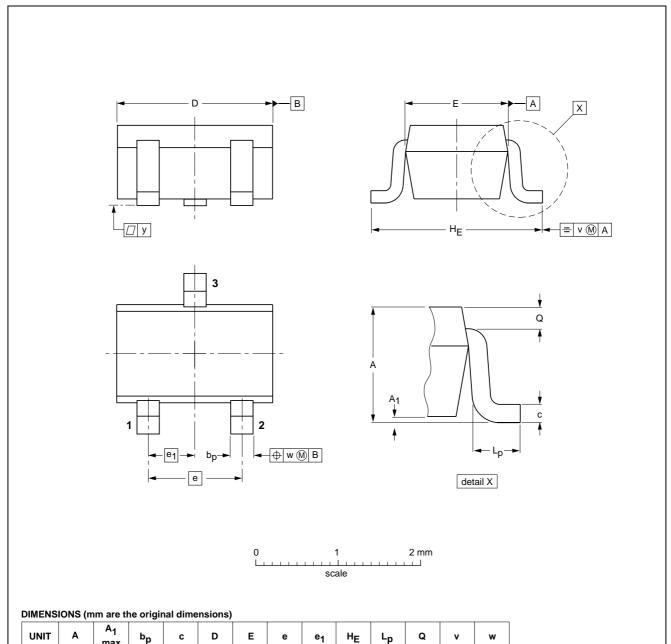
PNP general purpose transistors

BC856W; BC857W; BC858W

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

0.65

Lp

0.45 0.15

0.23 0.13

0.2

2002 Feb 04 8

bp

0.4 0.3

1.1

mm

0.25 0.10

2.2 1.8

1.35 1.15

PNP general purpose transistors

BC856W; BC857W; BC858W

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DATA SHEET STATUS(1)	PRODUCT STATUS ⁽²⁾	DEFINITIONS
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.
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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2002 Feb 04

PNP general purpose transistors

BC856W; BC857W; BC858W

NOTES

PNP general purpose transistors

BC856W; BC857W; BC858W

NOTES

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