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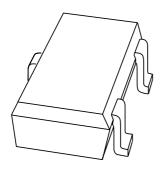
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Kind regards,

Team Nexperia

## **DISCRETE SEMICONDUCTORS**

# DATA SHEET



# BC856W; BC857W; BC858W PNP general purpose transistors

Product data sheet 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**

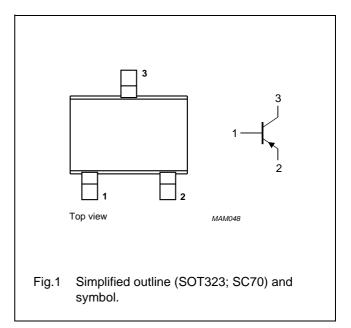
TYPE NUMBER	MARKING CODE <sup>(1)</sup>
BC856W	3D*
BC856AW	3A*
BC856BW	3B*
BC857W	3H*
BC857AW	3E*
BC857BW	3F*
BC857CW	3G*
BC858W	3M*

#### Note

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

#### **PINNING**

PIN	DESCRIPTION	
1	base	
2	emitter	
3	collector	



<sup>\* =</sup> 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 <sub>CBO</sub>	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 <sub>EBO</sub>	emitter-base voltage	open collector	_	-5	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

#### THERMAL CHARACTERISTICS

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

#### Note

1. Refer to SOT323 standard mounting conditions.

<sup>1.</sup> 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 <sub>CBO</sub>	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 <sub>EBO</sub>	emitter-base cut-off current	$V_{EB} = -5 \text{ V}; I_C = 0$	_	_	-100	nA
h <sub>FE</sub>	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 <sub>CEsat</sub>	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 <sub>BEsat</sub>	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 <sub>BE</sub>	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 <sub>c</sub>	collector capacitance	$V_{CB} = -10 \text{ V}; I_E = I_e = 0;$ f = 1 MHz	_	_	3	pF
C <sub>e</sub>	emitter capacitance $ V_{EB} = -0.5 \text{ V; } I_C = I_c = 0; \\ f = 1 \text{ MHz} $		_	_	12	pF
f <sub>T</sub>	transition frequency	V <sub>CE</sub> = -5 V; I <sub>C</sub> = -10 mA; f = 100 MHz	100	_	-	MHz
F	noise figure	$\begin{split} I_{C} &= -200 \; \mu A; \; V_{CE} = -5 \; V; \\ R_{S} &= 2 \; k \Omega; \; f = 1 \; k Hz; \\ B &= 200 \; Hz \end{split}$	_	-	10	dB

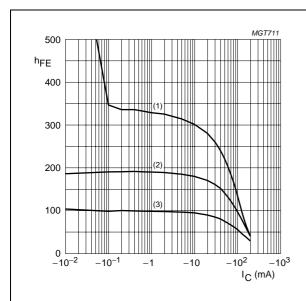
#### Note

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

2002 Feb 04

## PNP general purpose transistors

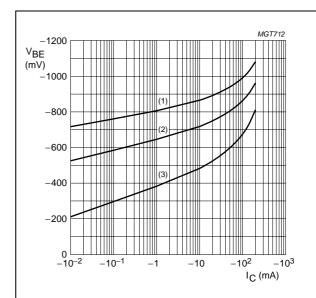
## BC856W; BC857W; BC858W



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

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

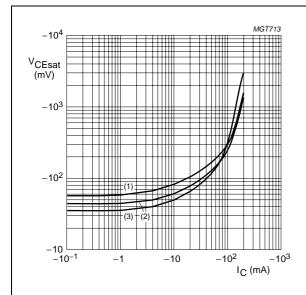
Fig.2 DC current gain as a function of collector current; typical values.



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

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

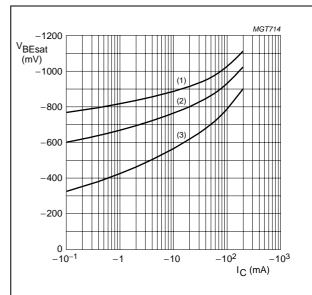
Fig.3 Base-emitter voltage as a function of collector current; typical values.



**BC857AW**;  $I_C/I_B = 20$ .

- (1) T<sub>amb</sub> = 150 °C.
- (2)  $T_{amb} = 25 \, ^{\circ}C$ .
- (3)  $T_{amb} = -55 \,^{\circ}\text{C}$ .

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



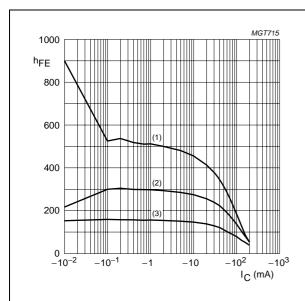
**BC857AW**;  $I_C/I_B = 20$ .

- (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

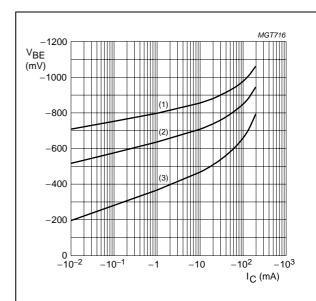
## BC856W; BC857W; BC858W



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

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

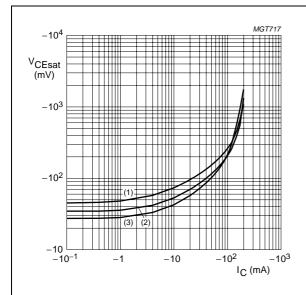
Fig.6 DC current gain as a function of collector current; typical values.



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

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

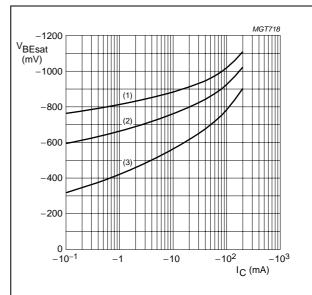
Fig.7 Base-emitter voltage as a function of collector current; typical values.



**BC857BW**;  $I_C/I_B = 20$ .

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

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



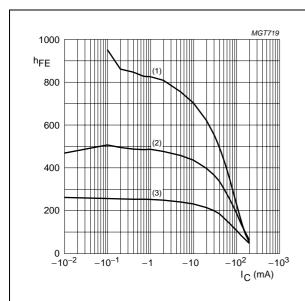
**BC857BW**;  $I_C/I_B = 20$ .

- (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

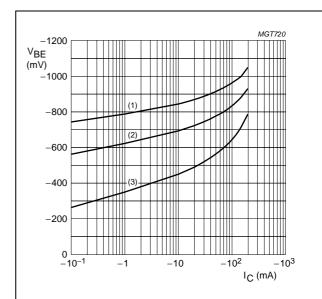
## BC856W; BC857W; BC858W



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

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

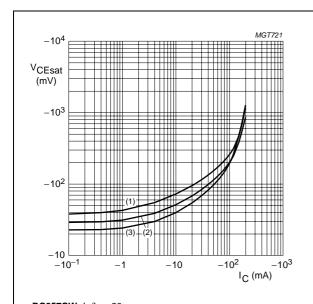
Fig.10 DC current gain as a function of collector current; typical values.



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

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

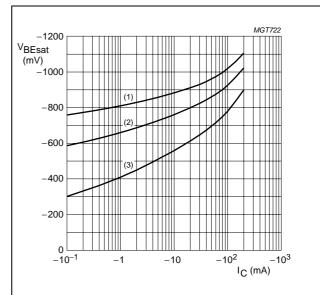
Fig.11 Base-emitter voltage as a function of collector current; typical values.



**BC857CW**;  $I_C/I_B = 20$ .

- (1) T<sub>amb</sub> = 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.

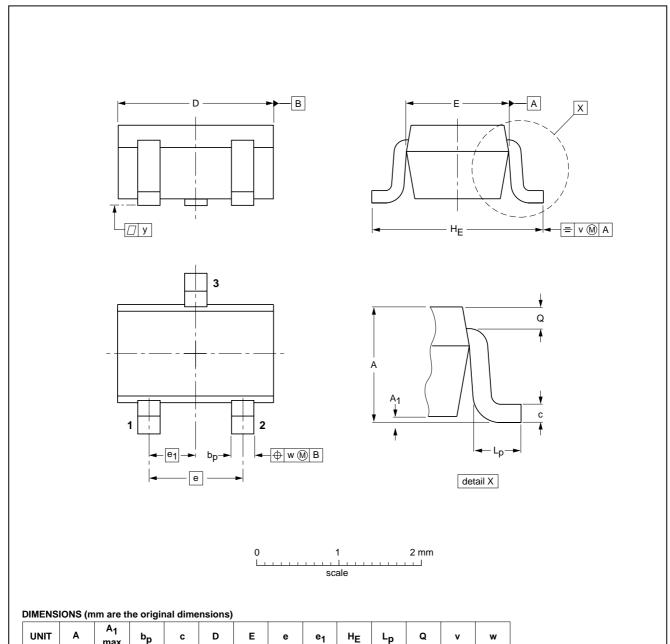
# PNP general purpose transistors

BC856W; BC857W; BC858W

#### **PACKAGE OUTLINE**

Plastic surface mounted package; 3 leads

**SOT323** 



OUTLINE		REFERENCES		EUROPEAN	ISSUE DATE	
VERSION	IEC	JEDEC	EIAJ		PROJECTION	1330E DATE
SOT323			SC-70			97-02-28

0.23 0.13

0.2

0.45

0.15

e<sub>1</sub>

0.65

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 $b_p$ 

0.4 0.3

1.1

mm

0.1

0.25

0.10

2.2

1.8

1.35

1.15

1.3

### PNP general purpose transistors

BC856W; BC857W; BC858W

#### **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.

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