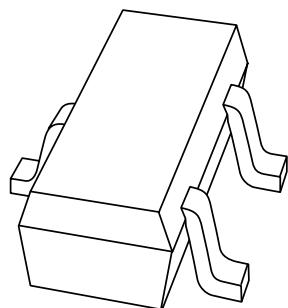


# DATA SHEET



## **BC856T; BC857T series** PNP general purpose transistors

Product data sheet  
Supersedes data of 1999 Apr 26

2000 Nov 15

## PNP general purpose transistors

BC856T; BC857T  
series

## FEATURES

- Low current (max. 100 mA)
- Low voltage (max. 65 V).

## APPLICATIONS

- General purpose switching and amplification, especially in portable equipment.

## DESCRIPTION

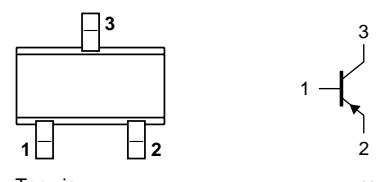
PNP transistor in an SC-75 (SOT416) plastic package.  
NPN complements: BC846T; BC847T series.

## MARKING

TYPE NUMBER	MARKING CODE
BC856AT	3A
BC856BT	3B
BC857AT	3E
BC857BT	3F
BC857CT	3G

## PINNING

PIN	DESCRIPTION
1	base
2	emitter
3	collector



Top view MAM362

Fig.1 Simplified outline (SC-75; SOT416) and symbol.

## LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$V_{CBO}$	collector-base voltage BC856AT; BC856BT BC857AT; BC857BT; BC857CT	open emitter	–	–80	V
			–	–50	V
$V_{CEO}$	collector-emitter voltage BC856AT; BC856BT BC857AT; BC857BT; BC857CT	open base	–	–65	V
			–	–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		–	–100	mA
$P_{tot}$	total power dissipation	$T_{amb} \leq 25^\circ\text{C}$ ; note 1	–	150	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.

## PNP general purpose transistors

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## THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-a}$	thermal resistance from junction to ambient	in free air; note 1	833	K/W

## Note

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

## CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$I_{CBO}$	collector-base cut-off current	$V_{CB} = -30\text{ V}; I_E = 0$	—	—	-15	nA
		$V_{CB} = -30\text{ V}; I_E = 0; T_j = 150^\circ\text{C}$	—	—	-5	$\mu\text{A}$
$I_{EBO}$	emitter cut-off current	$V_{EB} = -5\text{ V}; I_C = 0$	—	—	-100	nA
$h_{FE}$	DC current gain BC856AT; BC857AT BC856BT; BC857BT BC857CT	$V_{CE} = -5\text{ V}; I_C = -2\text{ mA}$				
			125	—	250	
			220	—	475	
			420	—	800	
$V_{CEsat}$	collector-emitter saturation voltage	$I_C = -10\text{ mA}; I_B = -0.5\text{ mA}$	—	—	-200	mV
		$I_C = -100\text{ mA}; I_B = -5\text{ mA}; \text{note 1}$	—	—	-400	mV
$V_{BE}$	base-emitter voltage	$I_C = -2\text{ mA}; V_{CE} = -5\text{ V}$	-580	—	-700	mV
		$I_C = -10\text{ mA}; V_{CE} = -5\text{ V}$	—	—	-770	mV
$C_c$	collector capacitance	$V_{CB} = -10\text{ V}; f = 1\text{ MHz}; I_E = i_e = 0$	—	—	2.5	pF
$C_e$	emitter capacitance	$V_{EB} = -0.5\text{ V}; f = 1\text{ MHz}; I_C = i_c = 0$	—	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	$I_C = -200\text{ }\mu\text{A}; V_{CE} = -5\text{ V}; R_S = 2\text{ k}\Omega; f = 1\text{ kHz}; B = 200\text{ Hz}$	—	—	10	dB

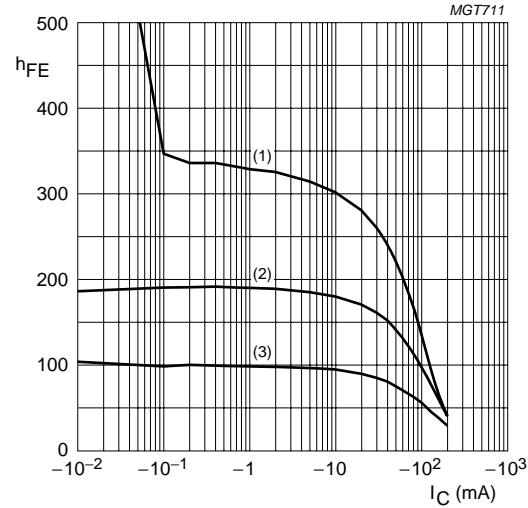
## Note

1. Pulse test:  $t_p \leq 300\text{ }\mu\text{s}; \delta \leq 0.02$ .

## PNP general purpose transistors

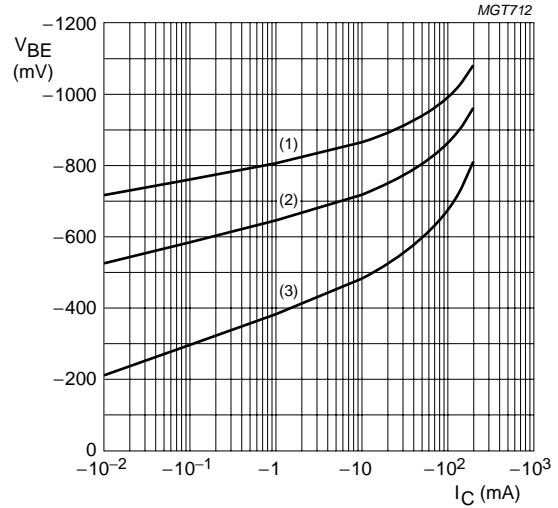
## BC856T; BC857T series

## GRAPHICAL INFORMATION BC857AT



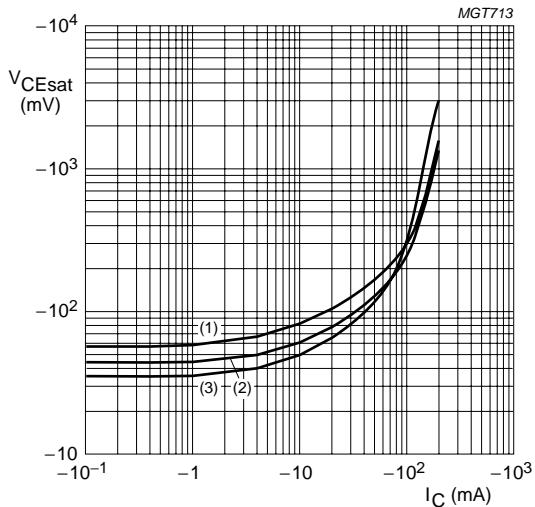
$V_{CE} = -5$  V.  
 (1)  $T_{amb} = 150^{\circ}C$ .  
 (2)  $T_{amb} = 25^{\circ}C$ .  
 (3)  $T_{amb} = -55^{\circ}C$ .

Fig.2 DC current gain; typical values.



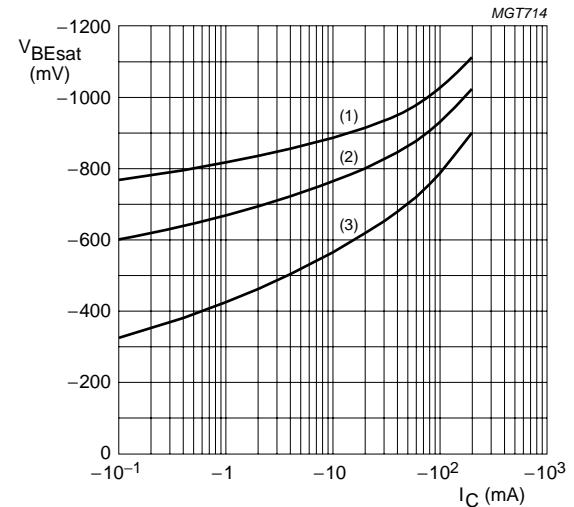
$V_{CE} = -5$  V.  
 (1)  $T_{amb} = -55^{\circ}C$ .  
 (2)  $T_{amb} = 25^{\circ}C$ .  
 (3)  $T_{amb} = 150^{\circ}C$ .

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



$I_C/I_B = 20$ .  
 (1)  $T_{amb} = 150^{\circ}C$ .  
 (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.



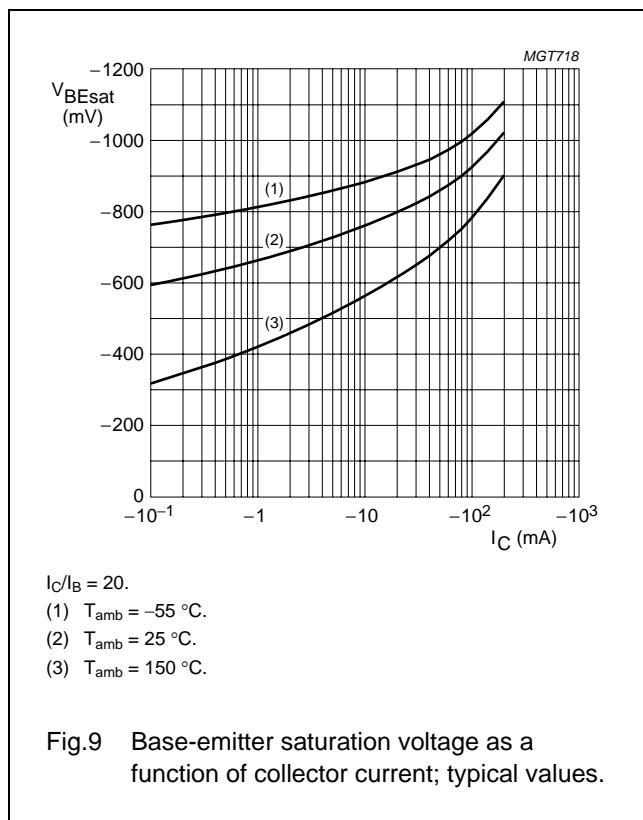
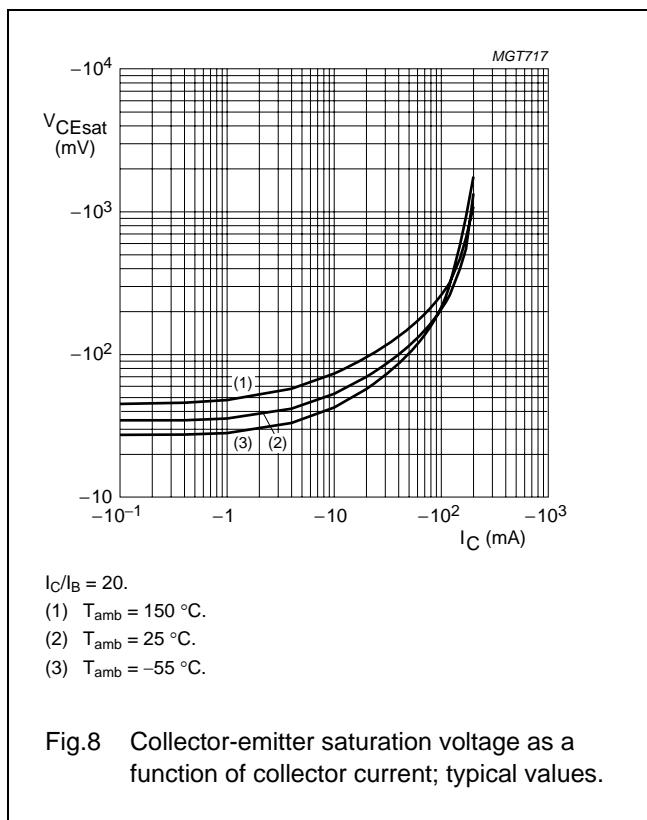
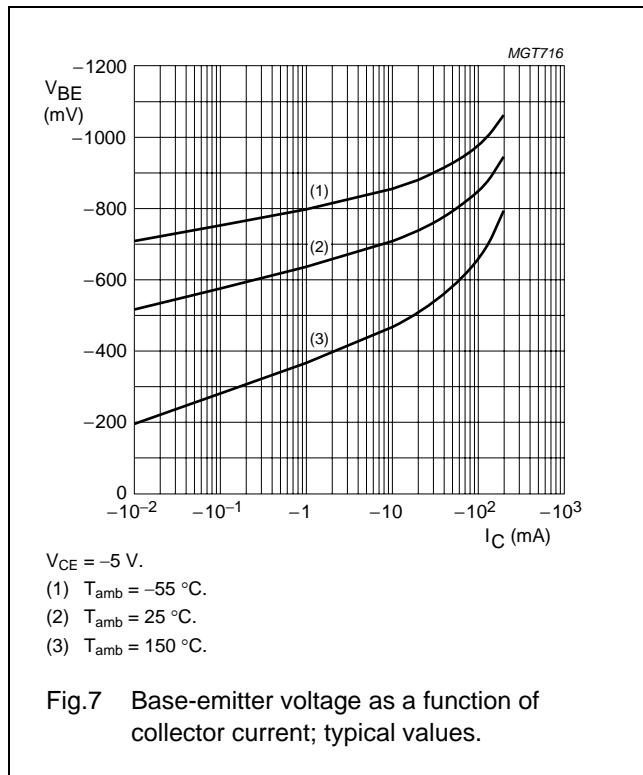
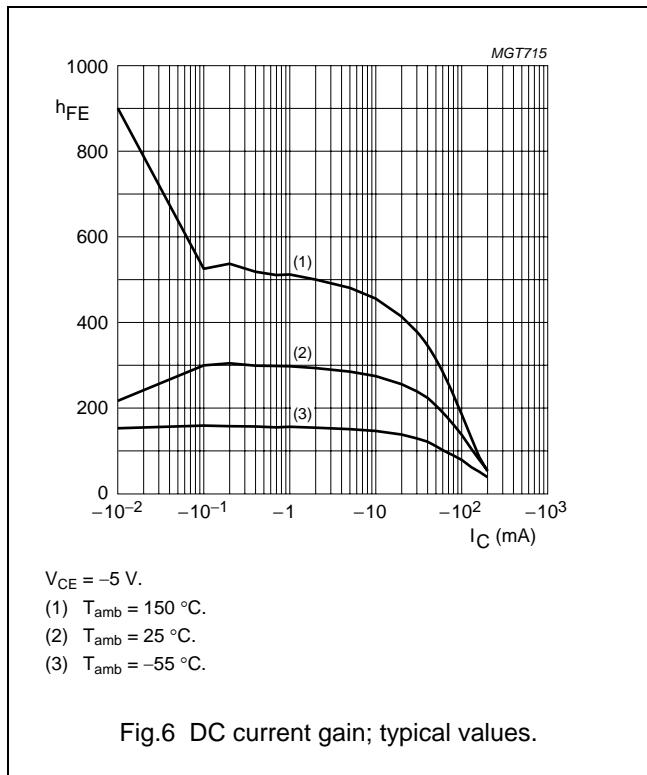
$I_C/I_B = 20$ .  
 (1)  $T_{amb} = -55^{\circ}C$ .  
 (2)  $T_{amb} = 25^{\circ}C$ .  
 (3)  $T_{amb} = 150^{\circ}C$ .

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

## PNP general purpose transistors

## BC856T; BC857T series

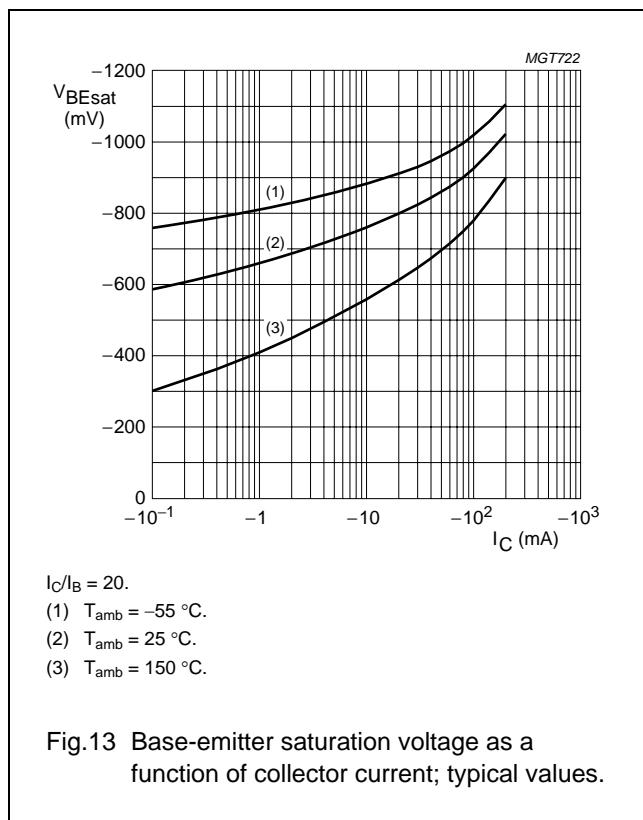
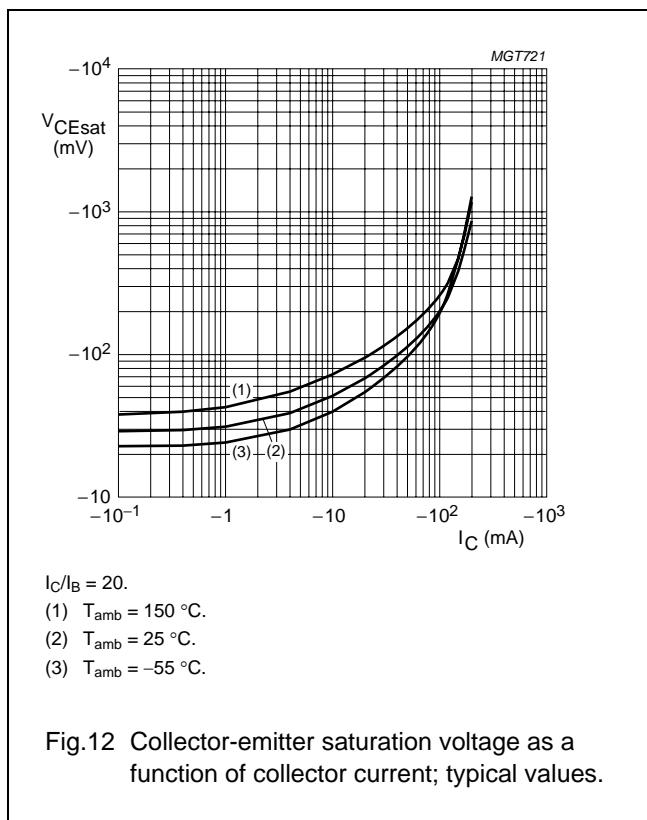
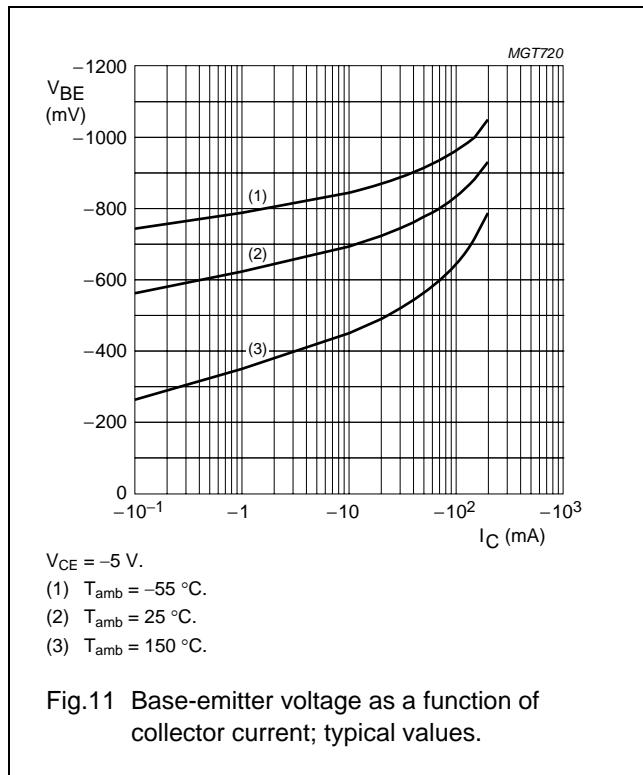
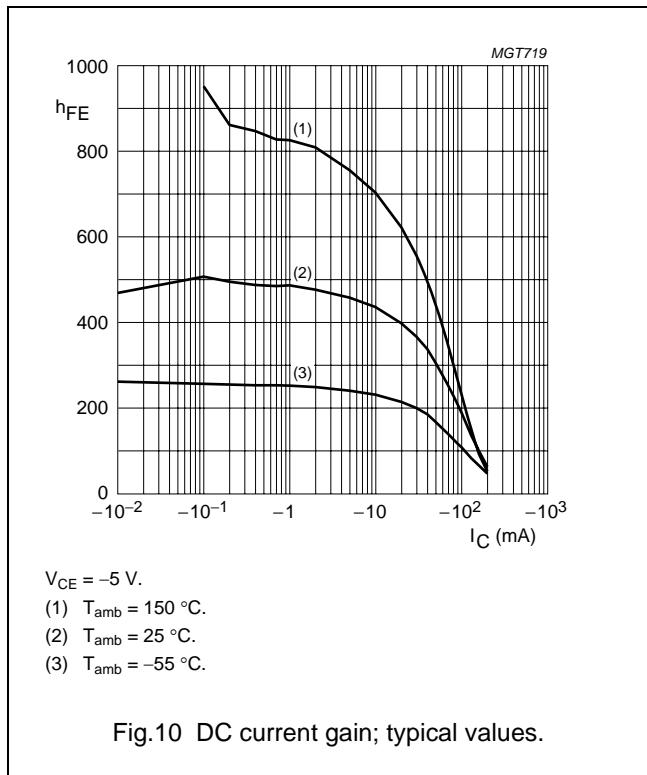
## GRAPHICAL INFORMATION BC857BT



## PNP general purpose transistors

## BC856T; BC857T series

## GRAPHICAL INFORMATION BC857CT



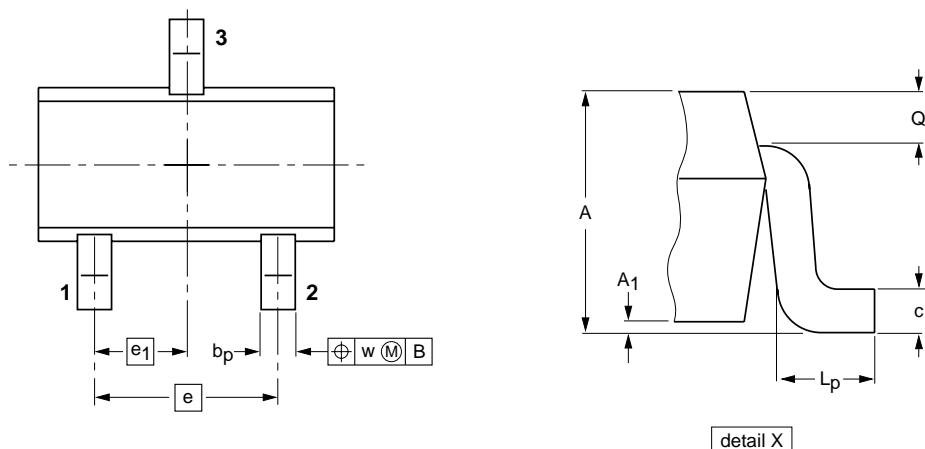
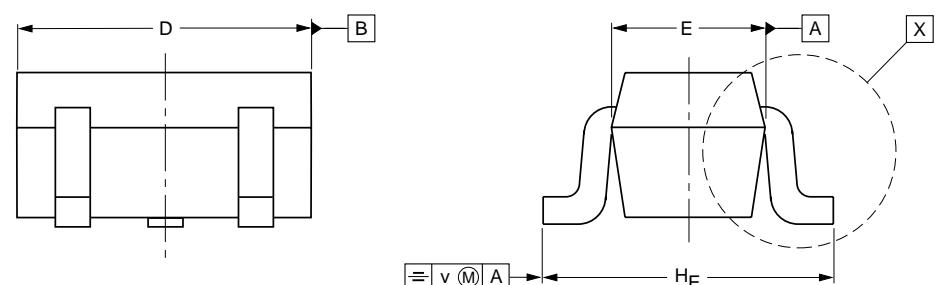
## PNP general purpose transistors

## BC856T; BC857T series

## PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT416



0      0.5      1 mm  
scale

## 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	0.95 0.60	0.1	0.30 0.15	0.25 0.10	1.8 1.4	0.9 0.7	1	0.5	1.75 1.45	0.45 0.15	0.23 0.13	0.2	0.2

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ	SC-75		
SOT416						97-02-28

## PNP general purpose transistors

## BC856T; BC857T series

## 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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