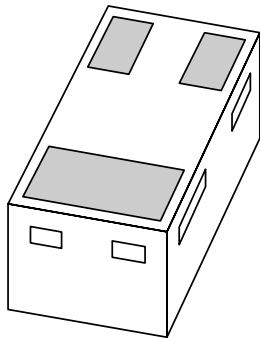


# DATA SHEET



## **BC857M series** PNP general purpose transistors

Product data sheet  
Supersedes data of 2003 Jul 15

2004 Mar 10

## PNP general purpose transistors

## BC857M series

## FEATURES

- Leadless ultra small plastic package (1 mm × 0.6 mm × 0.5 mm)
- Board space 1.3 × 0.9 mm
- Power dissipation comparable to SOT23.

## APPLICATIONS

- General purpose small signal DC
- Low and medium frequency AC applications
- Mobile communications, digital (still) cameras, PDAs, PCMCIA cards.

## DESCRIPTION

PNP general purpose transistor in a SOT883 leadless ultra small plastic package.

NPN complement: BC847M series.

## MARKING

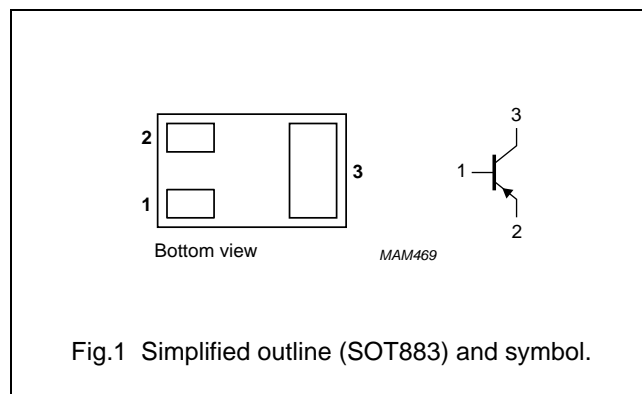
TYPE NUMBER	MARKING CODE
BC857AM	D1
BC857BM	D2
BC857CM	D3

## QUICK REFERENCE DATA

SYMBOL	PARAMETER	MAX.	UNIT
$V_{CEO}$	collector-emitter voltage	-45	V
$I_C$	collector current (DC)	-100	mA
$I_{CM}$	peak collector current	-200	mA

## PINNING

PIN	DESCRIPTION
1	base
2	emitter
3	collector



## ORDERING INFORMATION

TYPE NUMBER	PACKAGE		
	NAME	DESCRIPTION	VERSION
BC857AM	—	Leadless ultra small plastic package; 3 solder lands; body 1.0 x 0.6 x 0.5 mm	SOT883
BC857BM			
BC857CM			

## PNP general purpose transistors

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**LIMITING VALUES**

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$V_{CBO}$	collector-base voltage	open emitter	–	–50	V
$V_{CEO}$	collector-emitter voltage	open base	–	–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	$T_{amb} \leq 25\text{ °C}$			
		note 1	–	250	mW
		note 2	–	430	mW
$T_{stg}$	storage temperature		–65	+150	°C
$T_j$	junction temperature		–	150	°C
$T_{amb}$	operating ambient temperature		–65	+150	°C

**Notes**

1. Refer to SOT883 standard mounting conditions (footprint), FR4 with 60 µm copper strip line.
2. Device mounted on a FR4 printed-circuit board, single-sided copper, mounting pad for collector 1 cm<sup>2</sup>.

**THERMAL CHARACTERISTICS**

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air		
		note 1	500	K/W
		note 2	290	K/W

**Notes**

1. Refer to SOT883 standard mounting conditions (footprint), FR4 with 60 µm copper strip line.
2. Device mounted on a FR4 printed-circuit board, single-sided copper, mounting pad for collector 1 cm<sup>2</sup>.

## PNP general purpose transistors

## BC857M series

**CHARACTERISTICS**

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$I_{\text{CBO}}$	collector-base cut-off current	$V_{\text{CB}} = -30\text{ V}; I_{\text{E}} = 0$	–	–15	nA
		$V_{\text{CB}} = -30\text{ V}; I_{\text{E}} = 0; T_{\text{J}} = 150\text{ }^{\circ}\text{C}$	–	–5	$\mu\text{A}$
$I_{\text{EBO}}$	emitter-base cut-off current	$V_{\text{EB}} = -5\text{ V}; I_{\text{C}} = 0$	–	–100	nA
$h_{\text{FE}}$	DC current gain BC857AM BC857BM BC857CM	$V_{\text{CE}} = -5\text{ V}; I_{\text{C}} = -2\text{ mA}$			
			125	250	
			220	475	
			420	800	
$V_{\text{BE}}$	base-emitter voltage	$I_{\text{C}} = -2\text{ mA}; V_{\text{CE}} = -5\text{ V}$	–600	–750	mV
		$I_{\text{C}} = -10\text{ mA}; V_{\text{CE}} = -5\text{ V}$	–	–820	mV
$V_{\text{CEsat}}$	collector-emitter saturation voltage	$I_{\text{C}} = -10\text{ mA}; I_{\text{B}} = -0.5\text{ mA}$	–	–200	mV
		$I_{\text{C}} = -100\text{ mA}; I_{\text{B}} = -5\text{ mA}; \text{note 1}$	–	–400	mV
$C_{\text{c}}$	collector capacitance	$I_{\text{E}} = i_{\text{e}} = 0; V_{\text{CB}} = -10\text{ V}; f = 1\text{ MHz}$	–	2.5	pF
$f_{\text{T}}$	transition frequency	$V_{\text{CE}} = -5\text{ V}; I_{\text{C}} = -10\text{ mA}; f = 100\text{ MHz}$	100	–	MHz
F	noise figure	$I_{\text{C}} = -200\text{ }\mu\text{A}; V_{\text{CE}} = -5\text{ V}; R_{\text{S}} = 2\text{ k}\Omega; f = 1\text{ kHz}; B = 200\text{ Hz}$	–	10	dB

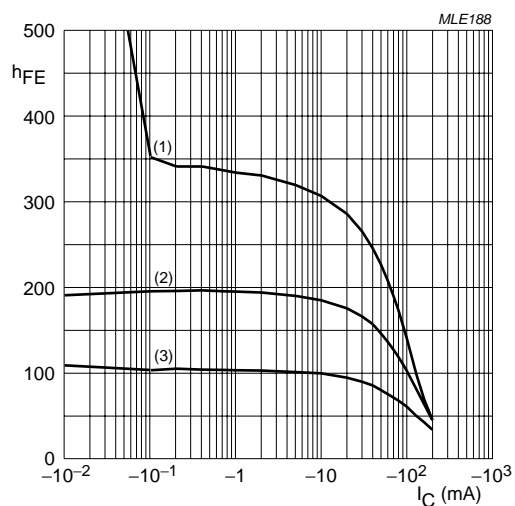
**Note**

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

## PNP general purpose transistors

## BC857M series

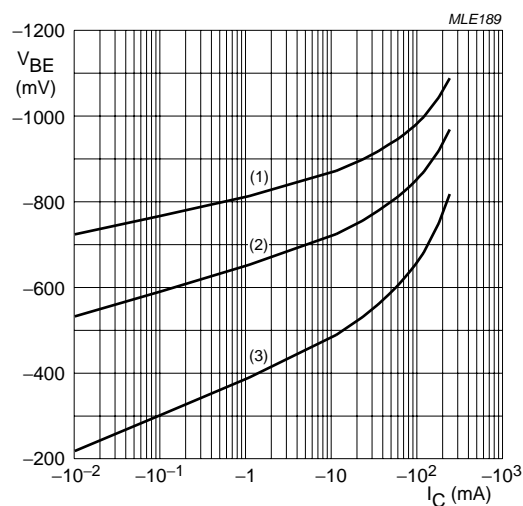
## GRAPHICAL INFORMATION BC857AM



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

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

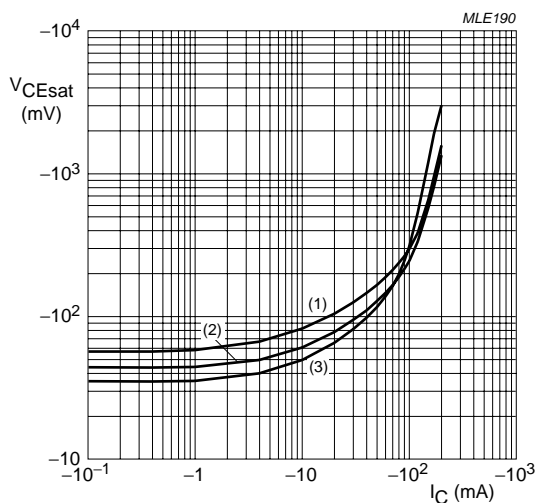
Fig.2 DC current gain; typical values.



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

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

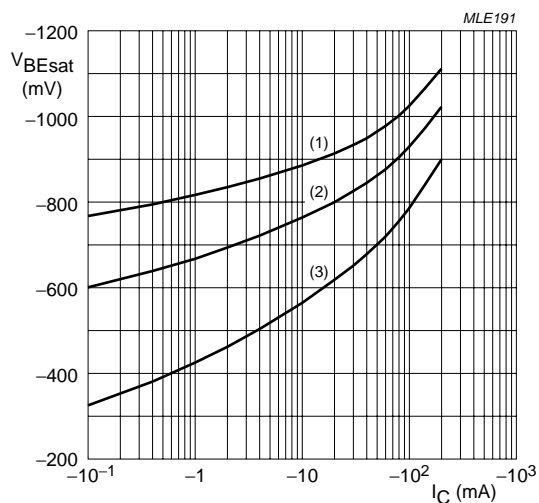
Fig.3 Base-emitter voltage as a function of collector current; typical values.



$I_C/I_B = 20.$

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

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



$I_C/I_B = 20.$

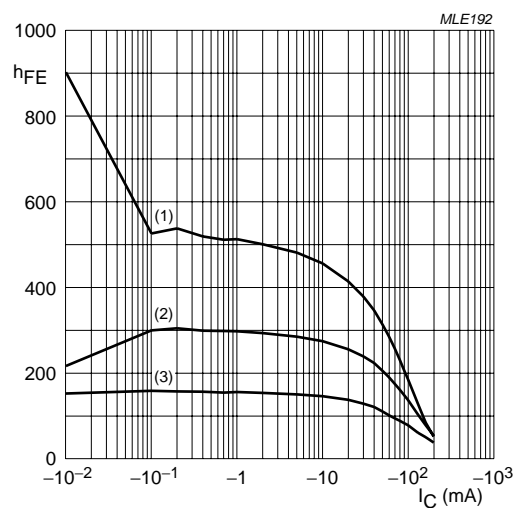
- (1)  $T_{amb} = -55 \text{ }^{\circ}\text{C.}$
- (2)  $T_{amb} = 25 \text{ }^{\circ}\text{C.}$
- (3)  $T_{amb} = 150 \text{ }^{\circ}\text{C.}$

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

## PNP general purpose transistors

## BC857M series

## GRAPHICAL INFORMATION BC857BM



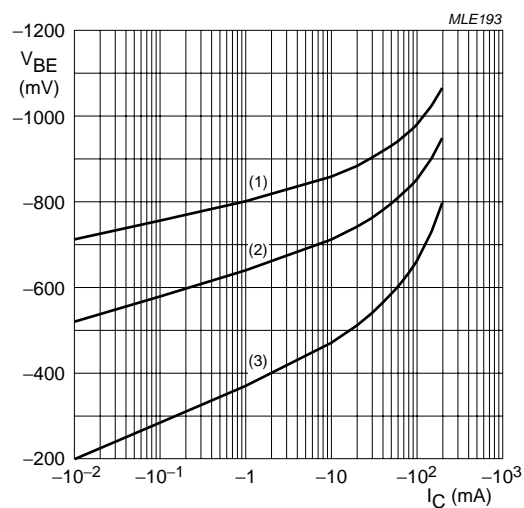
$V_{CE} = -5 \text{ V}$ .

(1)  $T_{amb} = 150 \text{ }^{\circ}\text{C}$ .

(2)  $T_{amb} = 25 \text{ }^{\circ}\text{C}$ .

(3)  $T_{amb} = -55 \text{ }^{\circ}\text{C}$ .

Fig.6 DC current gain; typical values.



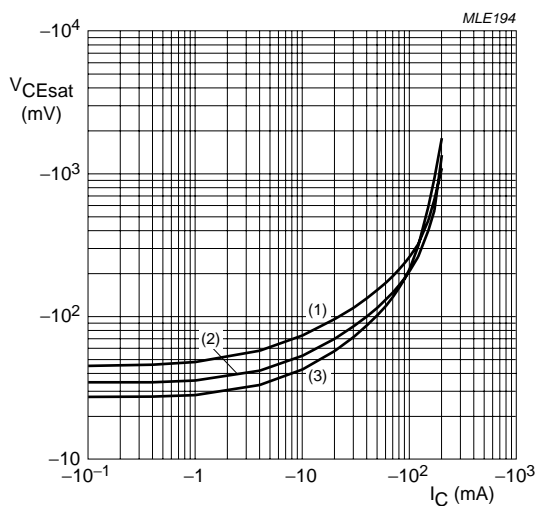
$V_{CE} = -5 \text{ V}$ .

(1)  $T_{amb} = -55 \text{ }^{\circ}\text{C}$ .

(2)  $T_{amb} = 25 \text{ }^{\circ}\text{C}$ .

(3)  $T_{amb} = 150 \text{ }^{\circ}\text{C}$ .

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



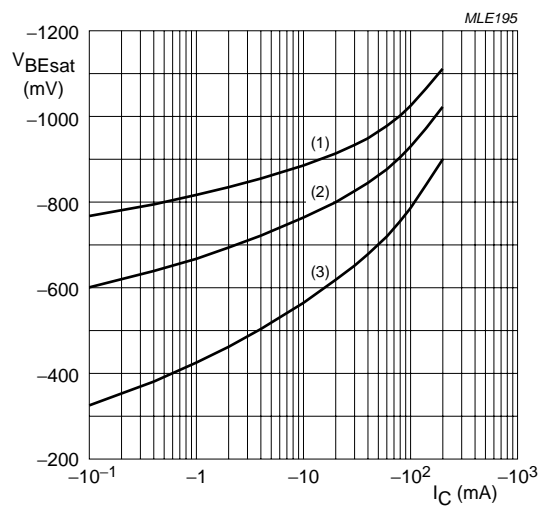
$I_C/I_B = 20$ .

(1)  $T_{amb} = 150 \text{ }^{\circ}\text{C}$ .

(2)  $T_{amb} = 25 \text{ }^{\circ}\text{C}$ .

(3)  $T_{amb} = -55 \text{ }^{\circ}\text{C}$ .

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



$I_C/I_B = 20$ .

(1)  $T_{amb} = -55 \text{ }^{\circ}\text{C}$ .

(2)  $T_{amb} = 25 \text{ }^{\circ}\text{C}$ .

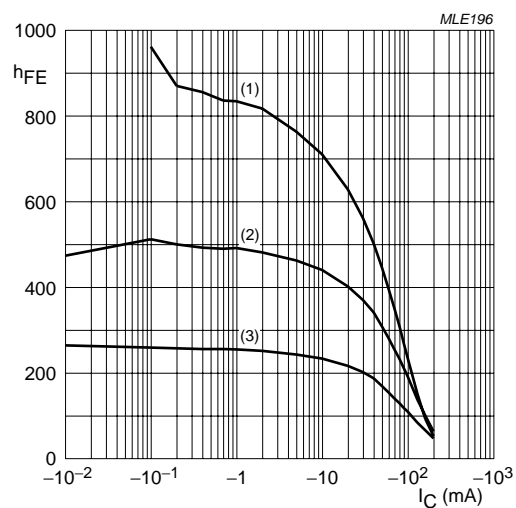
(3)  $T_{amb} = 150 \text{ }^{\circ}\text{C}$ .

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

## PNP general purpose transistors

## BC857M series

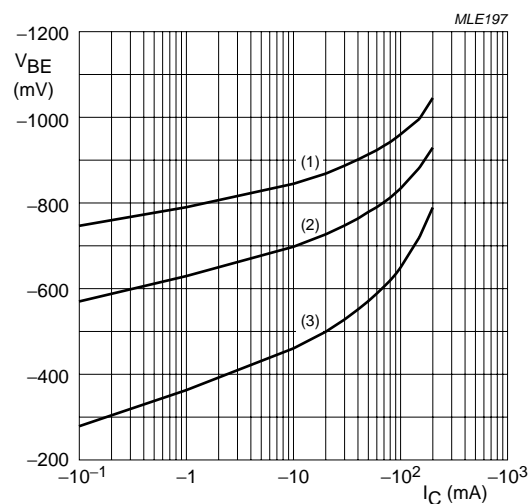
## GRAPHICAL INFORMATION BC857CM



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

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

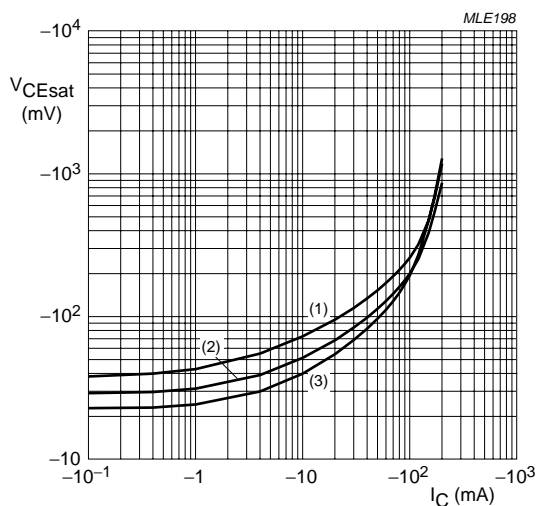
Fig.10 DC current gain; typical values.



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

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

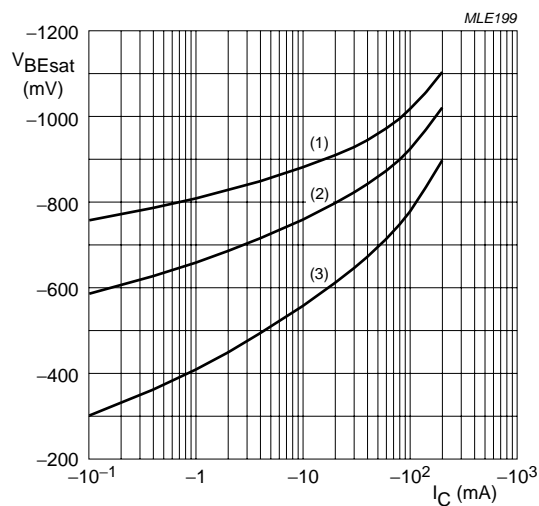
Fig.11 Base-emitter voltage as a function of collector current; typical values.



$I_C/I_B = 20$ .

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

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



$I_C/I_B = 20$ .

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

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

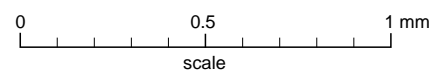
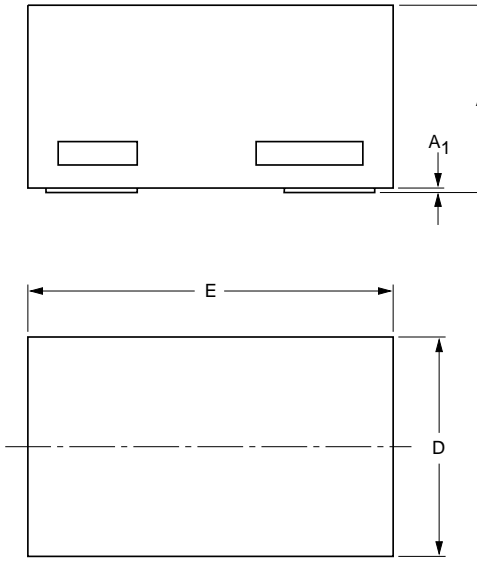
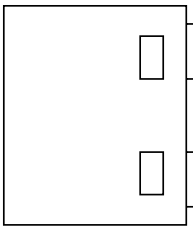
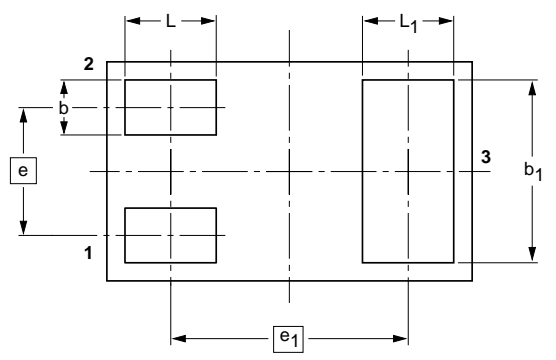
PNP general purpose transistors

BC857M series

PACKAGE OUTLINE

Leadless ultra small plastic package; 3 solder lands; body 1.0 x 0.6 x 0.5 mm

SOT883



DIMENSIONS (mm are the original dimensions)

UNIT	A <sup>(1)</sup>	A <sub>1</sub> max.	b	b <sub>1</sub>	D	E	e	e <sub>1</sub>	L	L <sub>1</sub>
mm	0.50 0.46	0.03	0.20 0.12	0.55 0.47	0.62 0.55	1.02 0.95	0.35	0.65	0.30 0.22	0.30 0.22

Note  
1. Including plating thickness

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT883			SC-101			03-02-05 03-04-03

## PNP general purpose transistors

## BC857M 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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Printed in The Netherlands

R75/02/pp10

Date of release: 2004 Mar 10

Document order number: 9397 750 12839

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