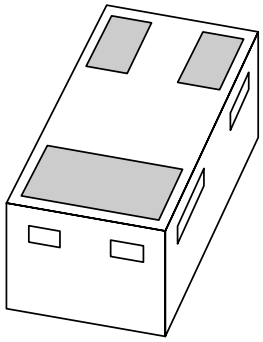
DATA SHEET



BC847M series
NPN general purpose transistors

Product specification
Supersedes data of 2003 Jul 15

2004 Mar 10

Philips
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NPN general purpose transistors BC847M 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

NPN general purpose transistor in a SOT883 leadless ultra small plastic package.
PNP complement: BC857M series.

MARKING

TYPE NUMBER	MARKING CODE
BC847AM	D4
BC847BM	D5
BC847CM	D6

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

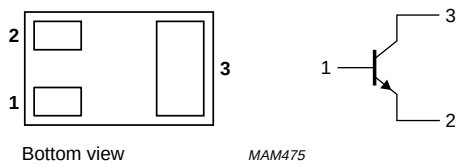


Fig.1 Simplified outline (SOT883) and symbol.

ORDERING INFORMATION

TYPE NUMBER	PACKAGE		
	NAME	DESCRIPTION	VERSION
BC847AM	–	Leadless ultra small plastic package; 3 solder lands; body 1.0 x 0.6 x 0.5 mm	SOT883
BC847BM			
BC847CM			

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	$T_{amb} \leq 25$ °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 stripline.
2. Device mounted on a FR4 printed-circuit board, single-sided copper, mounting pad for collector 1 cm^2.

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 stripline.
2. Device mounted on a FR4 printed-circuit board, single-sided copper, mounting pad for collector 1 cm^2.

CHARACTERISTICS

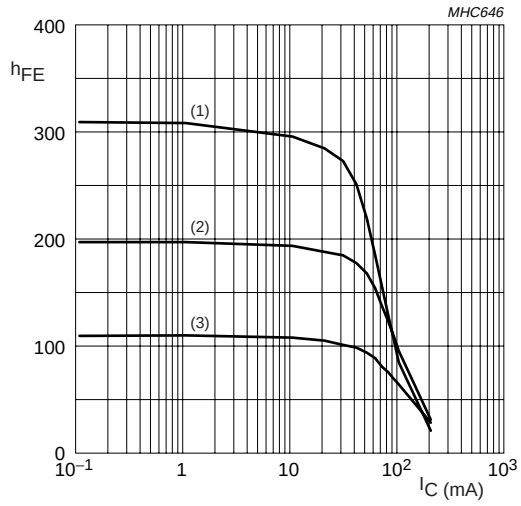
T_{amb} = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
I_{CBO}	collector-base cut-off current	V_{CB} = 30 V; I_E = 0	–	15	nA
		V_{CB} = 30 V; I_E = 0; T_j = 150 °C	–	5	µA
I_{EBO}	emitter-base cut-off current	V_{EB} = 5 V; I_C = 0	–	100	nA
h_{FE}	DC current gain	V_{CE} = 5 V; I_C = 2 mA			
	BC847AM		110	220	
	BC847BM		200	450	
	BC847CM		420	800	
V_{BE}	base-emitter voltage	I_C = 2 mA; V_{CE} = 5 V	580	700	mV
		I_C = 10 mA; V_{CE} = 5 V	–	770	mV
V_{CEsat}	collector-emitter saturation voltage	I_C = 10 mA; I_B = 0.5 mA	–	200	mV
		I_C = 100 mA; I_B = 5 mA; note 1	–	400	mV
C_c	collector capacitance	$I_E = i_e$ = 0; V_{CB} = 10 V; f = 1 MHz	–	1.5	pF
f_T	transition frequency	V_{CE} = 5 V; I_C = 10 mA; f = 100 MHz	100	–	MHz
F	noise figure	I_C = 200 µA; V_{CE} = 5 V; R_S = 2 kΩ; f = 1 kHz; B = 200 Hz	–	10	dB

Note

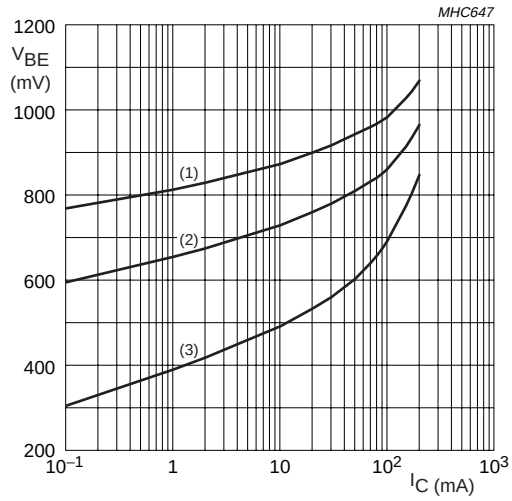
1. Pulse test: $t_p \leq 300$ µs; $\delta \leq 0.02$.

GRAPHICAL INFORMATION BC847AM



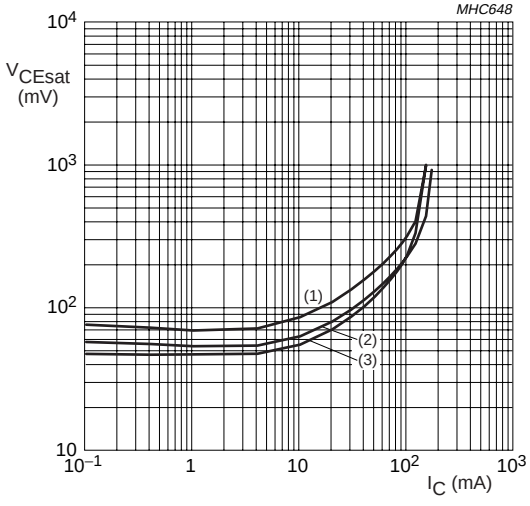
V_{CE} = 5 V.
(1) T_{amb} = 150 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = –55 °C.

Fig.2 DC current gain; typical values.



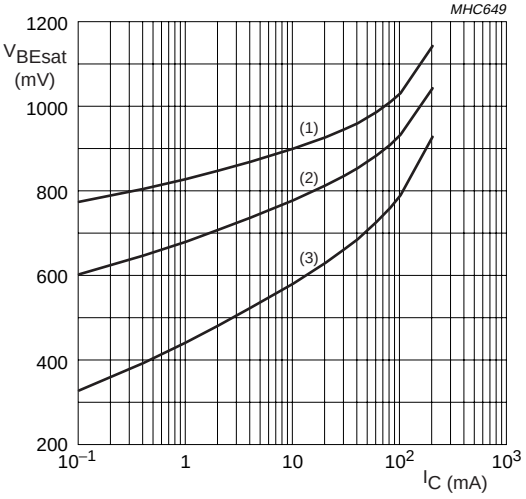
V_{CE} = 5 V.
(1) T_{amb} = –55 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = 150 °C.

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



I_C/I_B = 20.
(1) T_{amb} = 150 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = –55 °C.

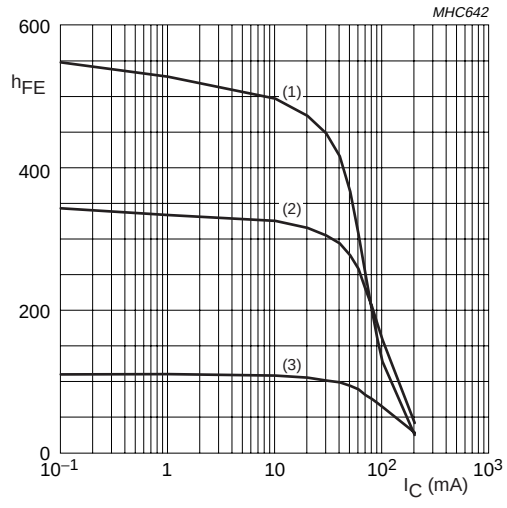
Fig.4 Collector-emitter saturation voltage as a function of collector current; typical values.



I_C/I_B = 10.
(1) T_{amb} = –55 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = 150 °C.

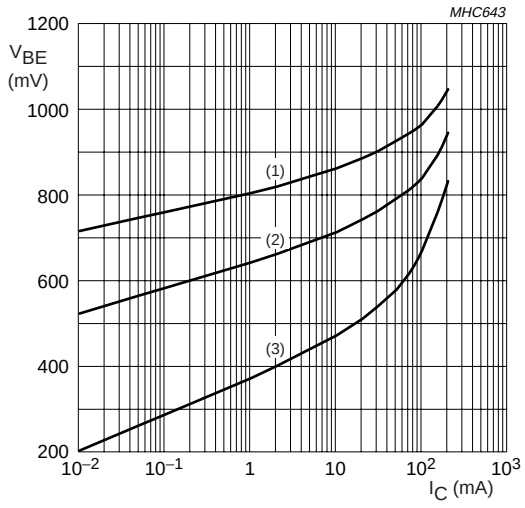
Fig.5 Base-emitter saturation voltage as a function of collector current; typical values.

GRAPHICAL INFORMATION BC847BM



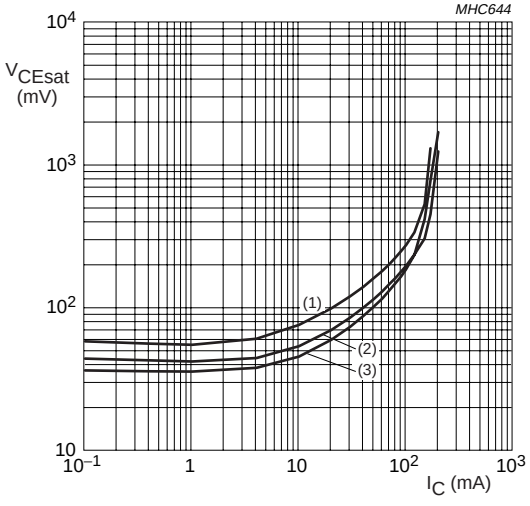
V_{CE} = 5 V.
(1) T_{amb} = 150 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = –55 °C.

Fig.6 DC current gain; typical values.



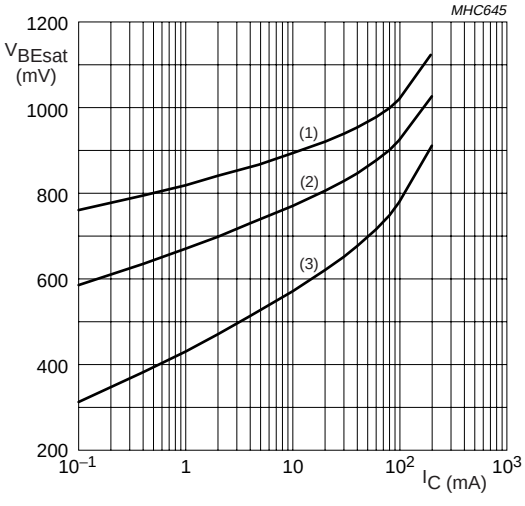
V_{CE} = 5 V.
(1) T_{amb} = –55 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = 150 °C.

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



I_C/I_B = 20.
(1) T_{amb} = 150 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = –55 °C.

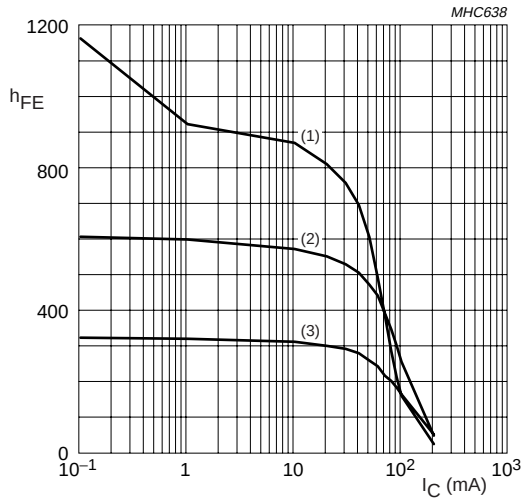
Fig.8 Collector-emitter saturation voltage as a function of collector current; typical values.



I_C/I_B = 10.
(1) T_{amb} = –55 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = 150 °C.

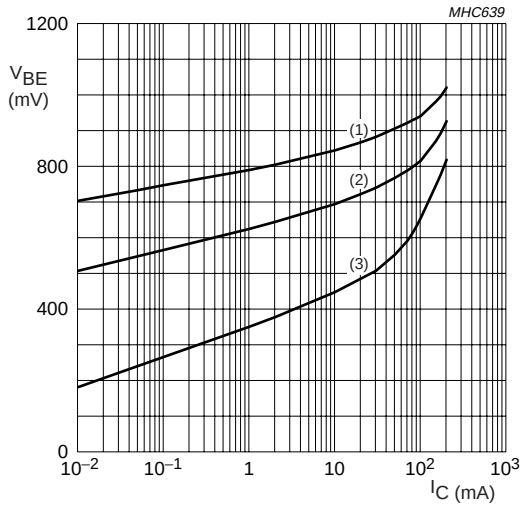
Fig.9 Base-emitter saturation voltage as a function of collector current; typical values.

GRAPHICAL INFORMATION BC847CM



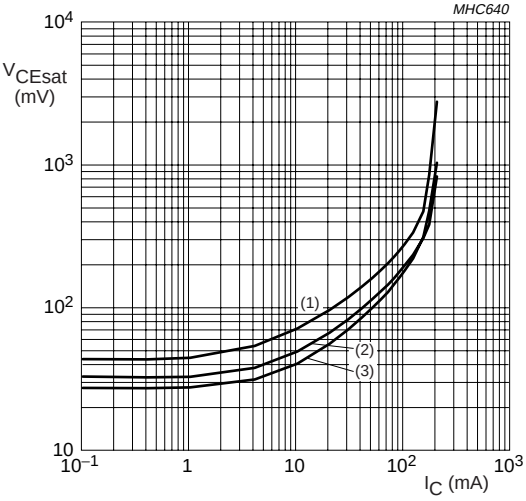
V_{CE} = 5 V.
(1) T_{amb} = 150 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = –55 °C.

Fig.10 DC current gain; typical values.



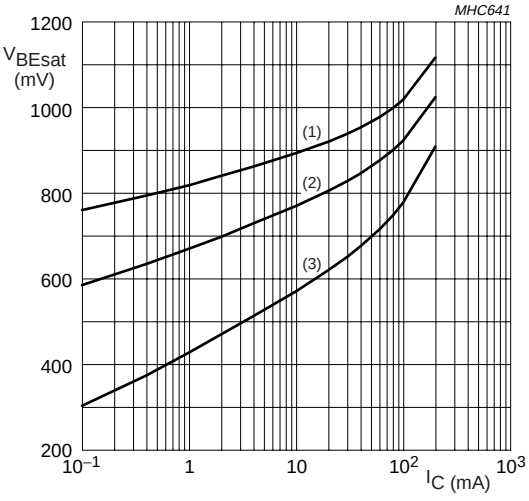
V_{CE} = 5 V.
(1) T_{amb} = –55 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = 150 °C.

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



I_C/I_B = 20.
(1) T_{amb} = 150 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = –55 °C.

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

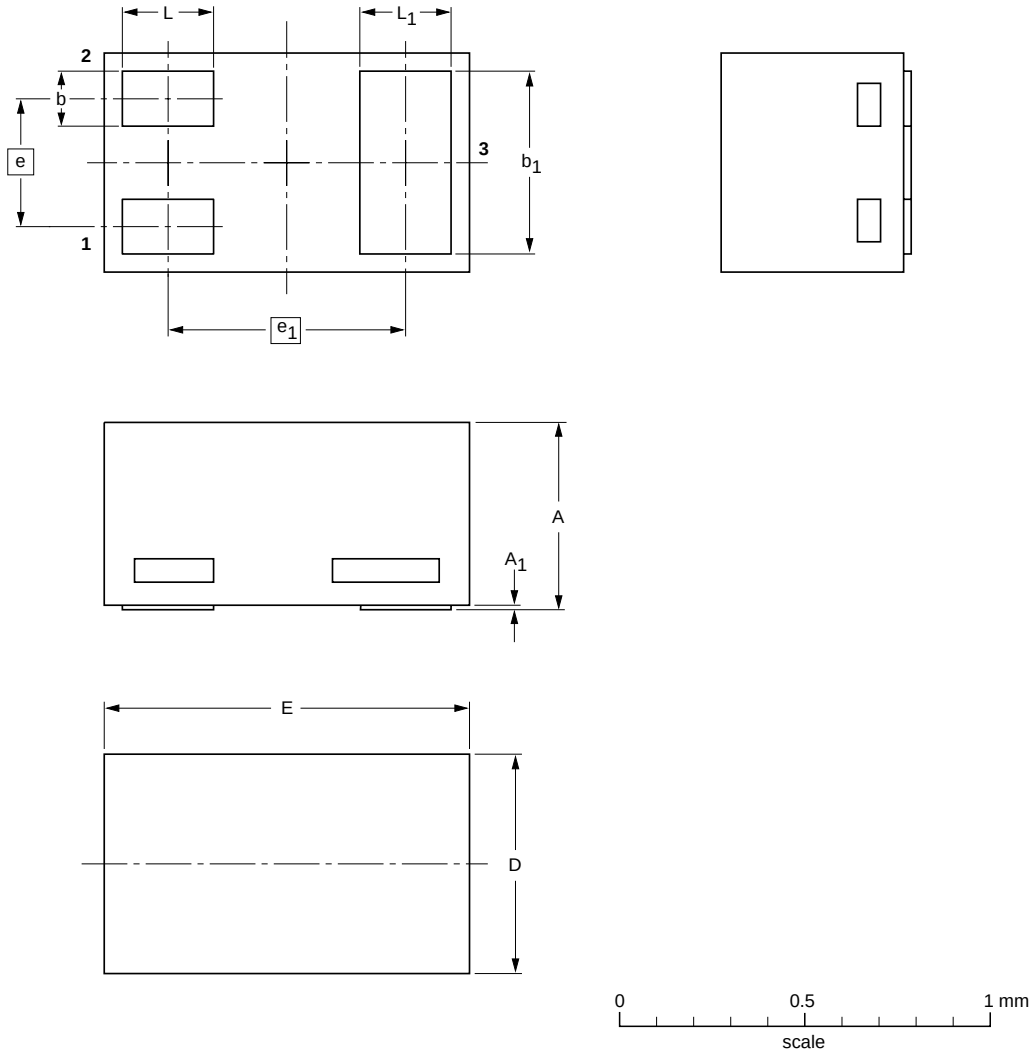


I_C/I_B = 10.
(1) T_{amb} = –55 °C.
(2) T_{amb} = 25 °C.
(3) T_{amb} = 150 °C.

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

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(1)	A_1 max.	b	b_1	D	E	e	e_1	L	L_1
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

DATA SHEET STATUS

LEVEL	DATA SHEET STATUS[1]	PRODUCT STATUS[2][3]	DEFINITION
I	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.
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3. For data sheets describing multiple type numbers, the highest-level product status determines the data sheet status.

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Limiting values definition — Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 60134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.

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