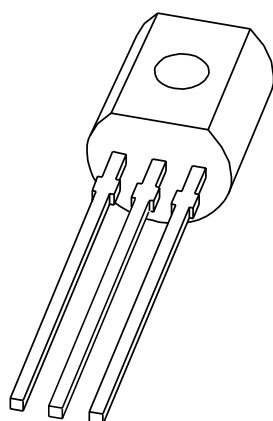


DATA SHEET



BC546; BC547 NPN general purpose transistors

Product specification
Supersedes data of 1999 Apr 15

2004 Nov 25

NPN general purpose transistors

BC546; BC547

FEATURES

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

APPLICATIONS

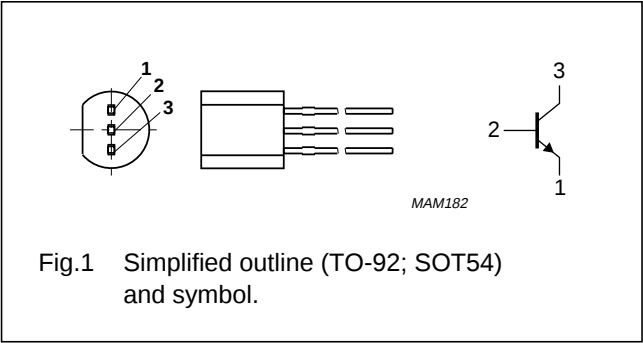
- General purpose switching and amplification.

DESCRIPTION

NPN transistor in a TO-92; SOT54 plastic package.
PNP complements: BC556 and BC557.

PINNING

PIN	DESCRIPTION
1	emitter
2	base
3	collector



ORDERING INFORMATION

TYPE NUMBER	PACKAGE		
	NAME	DESCRIPTION	VERSION
BC546A	SC-43A	plastic single-ended leaded (through hole) package; 3 leads	SOT54
BC546B			
BC547			
BC547B			
BC547C			

NPN general purpose transistors

BC546; BC547

LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V _{CBO}	collector-base voltage BC546A; BC546B BC547	open emitter	–	80	V
			–	50	V
V _{CEO}	collector-emitter voltage BC546A; BC546B BC547; BC547B; BC547C	open base	–	65	V
			–	45	V
V _{EBO}	emitter-base voltage BC546A; BC546B BC547; BC547B; BC547C	open collector	–	6	V
			–	6	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	–	500	mW
T _{stg}	storage temperature		–65	+150	°C
T _j	junction temperature		–	150	°C
T _{amb}	ambient temperature		–65	+150	°C

Note

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

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
R _{th(j-a)}	thermal resistance from junction to ambient	note 1	250	K/W

Note

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

NPN general purpose transistors

BC546; BC547

CHARACTERISTICS

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

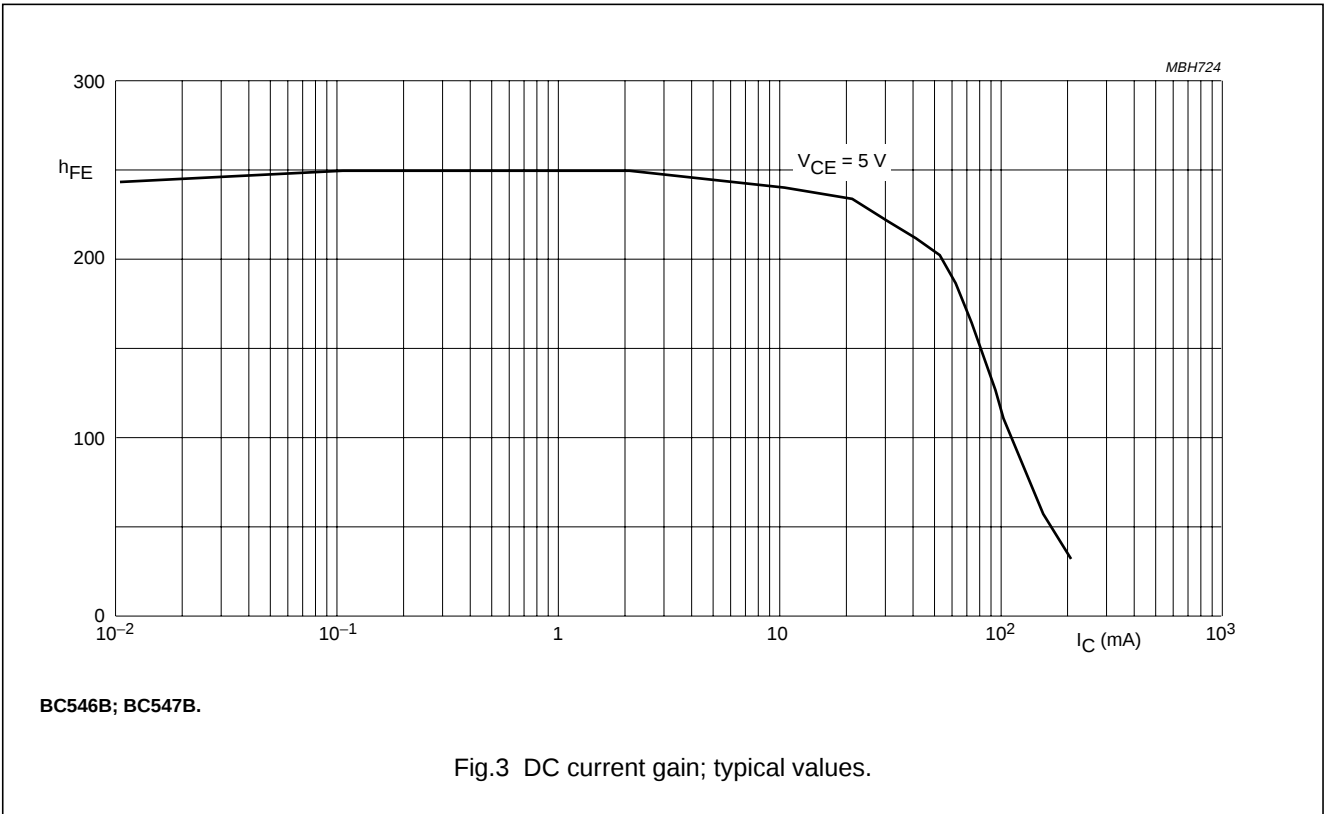
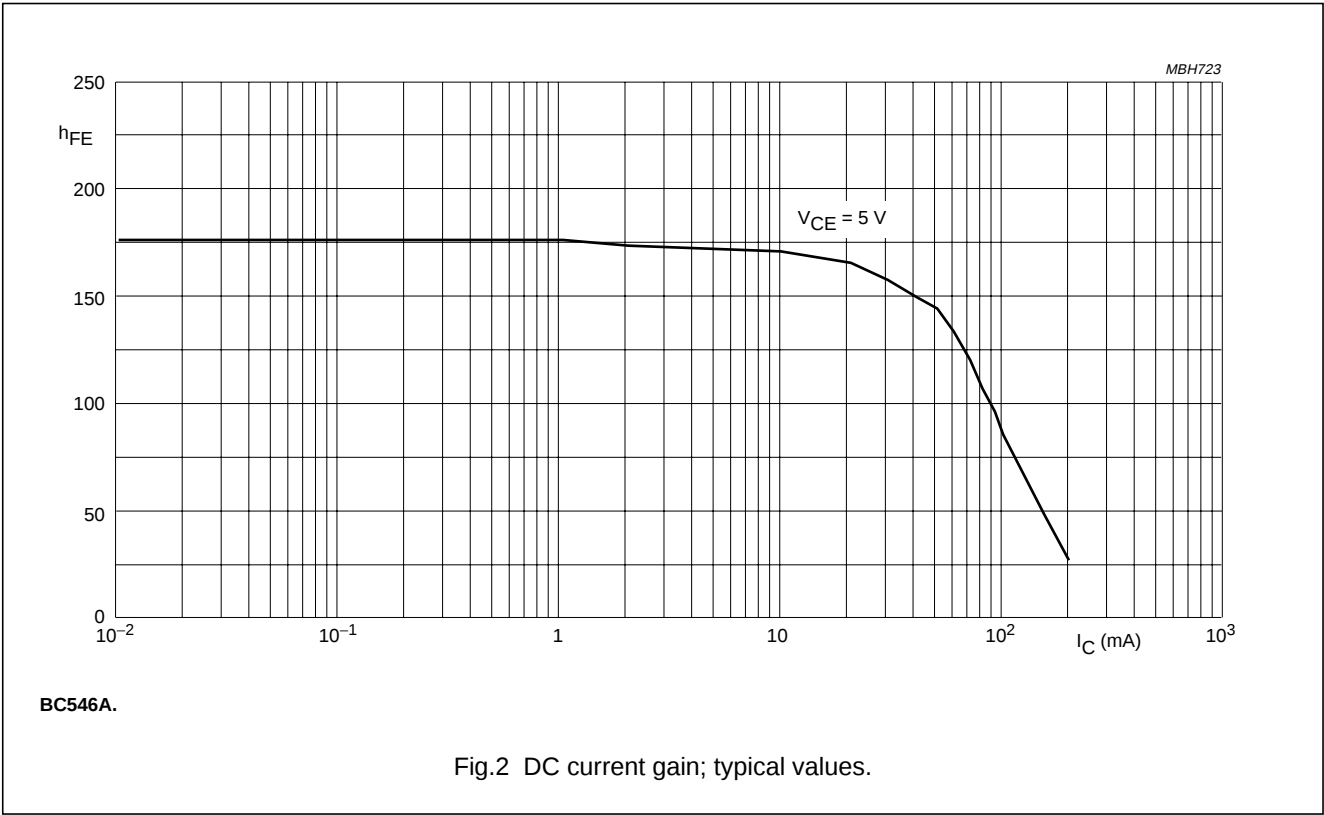
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_{CBO}	collector-base cut-off current	$V_{CB} = 30\text{ V}; I_E = 0\text{ A}$	–	–	15	nA
		$V_{CB} = 30\text{ V}; I_E = 0\text{ A}; T_j = 150\text{ °C}$	–	–	5	μA
I_{EBO}	emitter-base cut-off current	$V_{EB} = 5\text{ V}; I_C = 0\text{ A}$	–	–	100	nA
h_{FE}	DC current gain	$V_{CE} = 5\text{ V}; I_C = 10\text{ }\mu\text{A};$ see Figs 2, 3 and 4	–	–	–	–
	BC546A		–	90	–	–
	BC546B; BC547B		–	150	–	–
	BC547C		–	270	–	–
	DC current gain	$V_{CE} = 5\text{ V}; I_C = 2\text{ mA};$ see Figs 2, 3 and 4	110	180	220	–
	BC546A		200	290	450	–
V_{CEsat}	collector-emitter saturation voltage	$I_C = 10\text{ mA}; I_B = 0.5\text{ mA}$	–	90	250	mV
		$I_C = 100\text{ mA}; I_B = 5\text{ mA}$	–	200	600	mV
V_{BEsat}	base-emitter saturation voltage	$I_C = 10\text{ mA}; I_B = 0.5\text{ mA};$ note 1	–	700	–	mV
		$I_C = 100\text{ mA}; I_B = 5\text{ mA};$ note 1	–	900	–	mV
V_{BE}	base-emitter voltage	$V_{CE} = 5\text{ V}; I_C = 2\text{ mA};$ note 2	580	660	700	mV
		$V_{CE} = 5\text{ V}; I_C = 10\text{ mA}$	–	–	770	mV
C_c	collector capacitance	$V_{CB} = 10\text{ V}; I_E = I_{E0} = 0\text{ A}; f = 1\text{ MHz}$	–	1.5	–	pF
C_e	emitter capacitance	$V_{EB} = 0.5\text{ V}; I_C = I_{C0} = 0\text{ A};$ $f = 1\text{ MHz}$	–	11	–	pF
f_T	transition frequency	$V_{CE} = 5\text{ V}; I_C = 10\text{ mA}; f = 100\text{ MHz}$	100	–	–	MHz
F	noise figure	$V_{CE} = 5\text{ V}; I_C = 200\text{ }\mu\text{A}; R_S = 2\text{ k}\Omega;$ $f = 1\text{ kHz}; B = 200\text{ Hz}$	–	2	10	dB

Notes

- V_{BEsat} decreases by about 1.7 mV/K with increasing temperature.
- V_{BE} decreases by about 2 mV/K with increasing temperature.

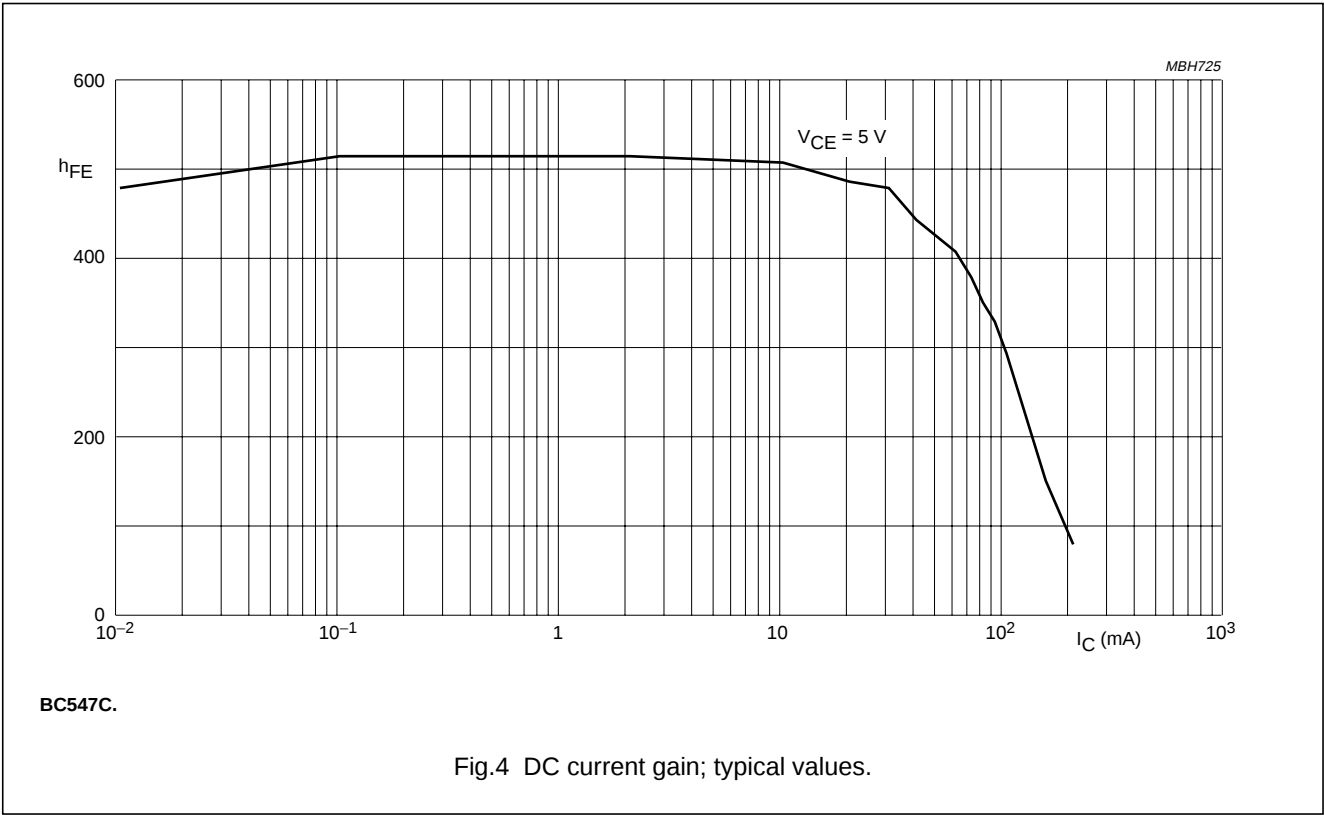
NPN general purpose transistors

BC546; BC547



NPN general purpose transistors

BC546; BC547



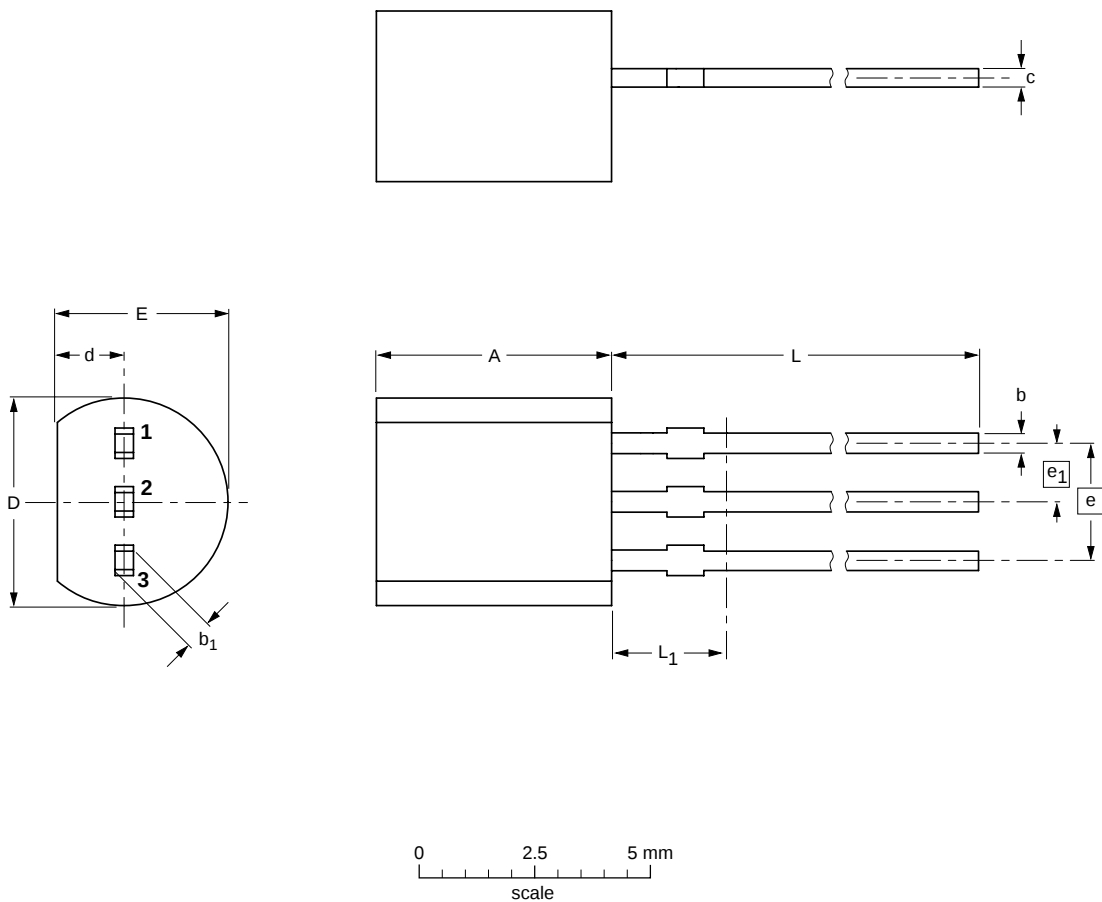
NPN general purpose transistors

BC546; BC547

PACKAGE OUTLINE

Plastic single-ended leaded (through hole) package; 3 leads

SOT54



DIMENSIONS (mm are the original dimensions)

UNIT	A	b	b ₁	c	D	d	E	e	e ₁	L	L ₁ ⁽¹⁾ max.
mm	5.2 5.0	0.48 0.40	0.66 0.55	0.45 0.38	4.8 4.4	1.7 1.4	4.2 3.6	2.54	1.27	14.5 12.7	2.5

Note

1. Terminal dimensions within this zone are uncontrolled to allow for flow of plastic and terminal irregularities.

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT54		TO-92	SC-43A			04-06-28 04-11-16

NPN general purpose transistors

BC546; BC547

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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