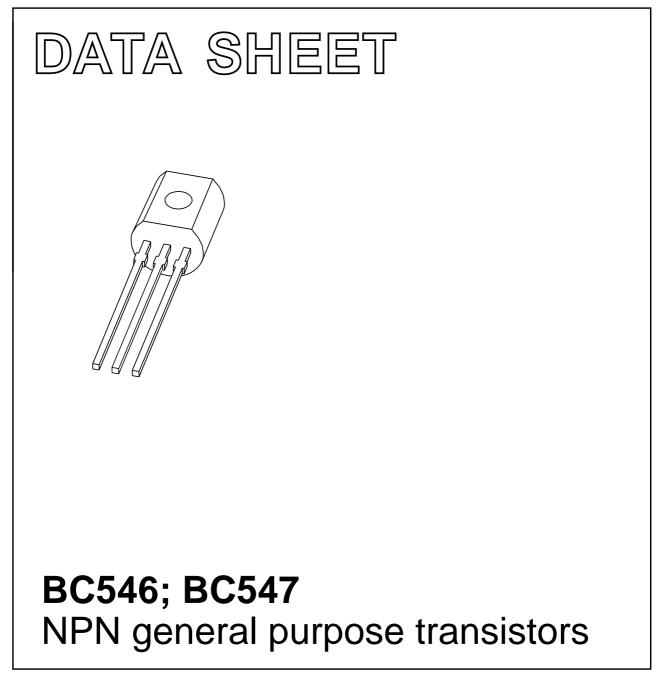
DISCRETE SEMICONDUCTORS



Product specification Supersedes data of 1999 Apr 15

2004 Nov 25



BC546; BC547

NPN general purpose transistors

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	

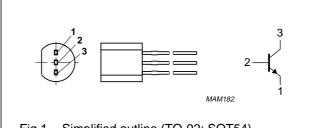


Fig.1 Simplified outline (TO-92; SOT54) and symbol.

ORDERING INFORMATION

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

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	open emitter			
	BC546A; BC546B		_	80	V
	BC547		_	50	V
V _{CEO}	collector-emitter voltage	open base			
	BC546A; BC546B		_	65	V
	BC547; BC547B; BC547C		_	45	V
V _{EBO}	emitter-base voltage	open collector			
	BC546A; BC546B		-	6	V
	BC547; BC547B; BC547C		-	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
Tj	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.

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CHARACTERISTICS

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

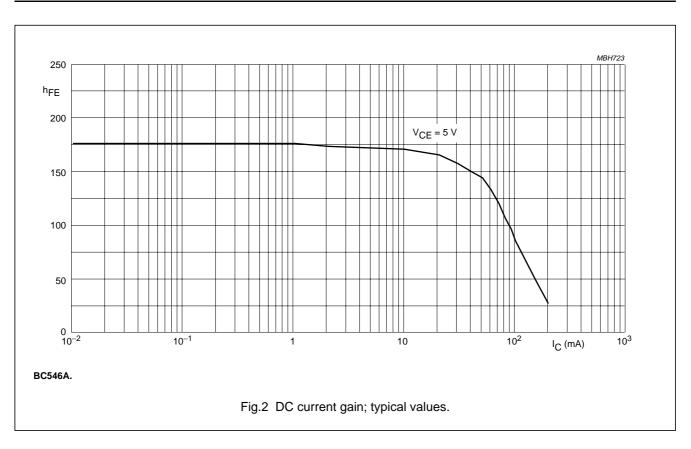
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I _{CBO}	collector-base cut-off current	$V_{CB} = 30 \text{ V}; \text{ I}_{\text{E}} = 0 \text{ A}$	-	-	15	nA
		$V_{CB} = 30 \text{ V}; \text{ I}_{E} = 0 \text{ A}; \text{ T}_{j} = 150 ^{\circ}\text{C}$	_	-	5	μA
I _{EBO}	emitter-base cut-off current	$V_{EB} = 5 \text{ V}; I_{C} = 0 \text{ A}$	-	-	100	nA
h _{FE}	DC current gain BC546A	$V_{CE} = 5 \text{ V}; I_C = 10 \mu\text{A};$ see Figs 2, 3 and 4	_	90	_	
	BC546B; BC547B		-	150	-	
	BC547C DC current gain BC546A BC546B; BC547B BC547C	$V_{CE} = 5 \text{ V}; I_C = 2 \text{ mA};$ see Figs 2, 3 and 4	- 110 200 420	270 180 290 520	- 220 450 800	
	BC547		110	-	800	
V _{CEsat}	collector-emitter saturation voltage	I _C = 10 mA; I _B = 0.5 mA	-	90	250	mV
		I _C = 100 mA; I _B = 5 mA	-	200	600	mV
V _{BEsat}	base-emitter saturation voltage	$I_{C} = 10 \text{ mA}; I_{B} = 0.5 \text{ mA}; \text{ note } 1$	-	700	-	mV
		$I_{C} = 100 \text{ mA}; I_{B} = 5 \text{ mA}; \text{ note } 1$	-	900	-	mV
V_{BE}	base-emitter voltage	$V_{CE} = 5 \text{ V}; I_{C} = 2 \text{ mA}; \text{ note } 2$	580	660	700	mV
		$V_{CE} = 5 \text{ V}; I_{C} = 10 \text{ mA}$	-	_	770	mV
Cc	collector capacitance	$V_{CB} = 10 V; I_E = i_e = 0 A; f = 1 MHz$	-	1.5	-	pF
C _e	emitter capacitance	$V_{EB} = 0.5 \text{ V}; I_{C} = i_{c} = 0 \text{ A};$ f = 1 MHz	-	11	-	pF
f _T	transition frequency	V _{CE} = 5 V; I _C = 10mA; f = 100 MHz	100	_	_	MHz
F	noise figure	$V_{CE} = 5 \text{ V}; \text{ I}_{C} = 200 \mu\text{A}; \text{ R}_{S} = 2 k\Omega;$ f = 1 kHz; B = 200 Hz	-	2	10	dB

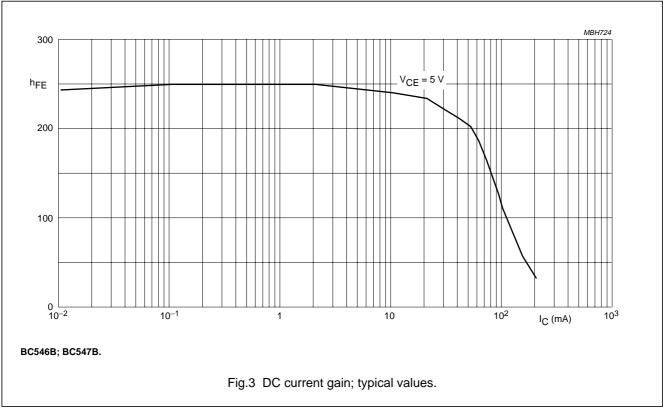
Notes

1. V_{BEsat} decreases by about 1.7 mV/K with increasing temperature.

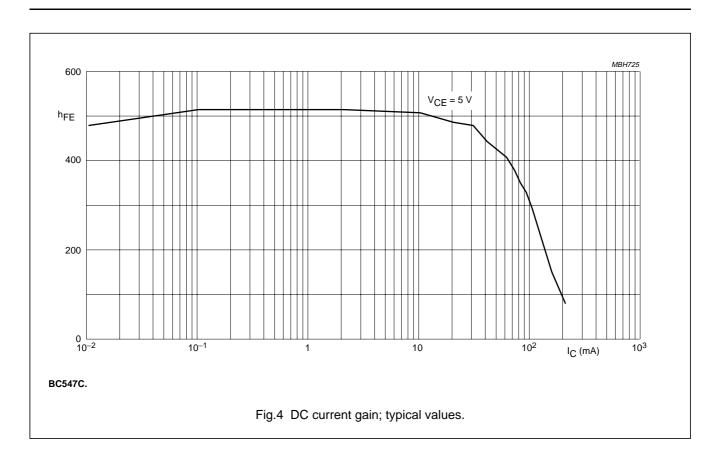
2. V_{BE} decreases by about 2 mV/K with increasing temperature.

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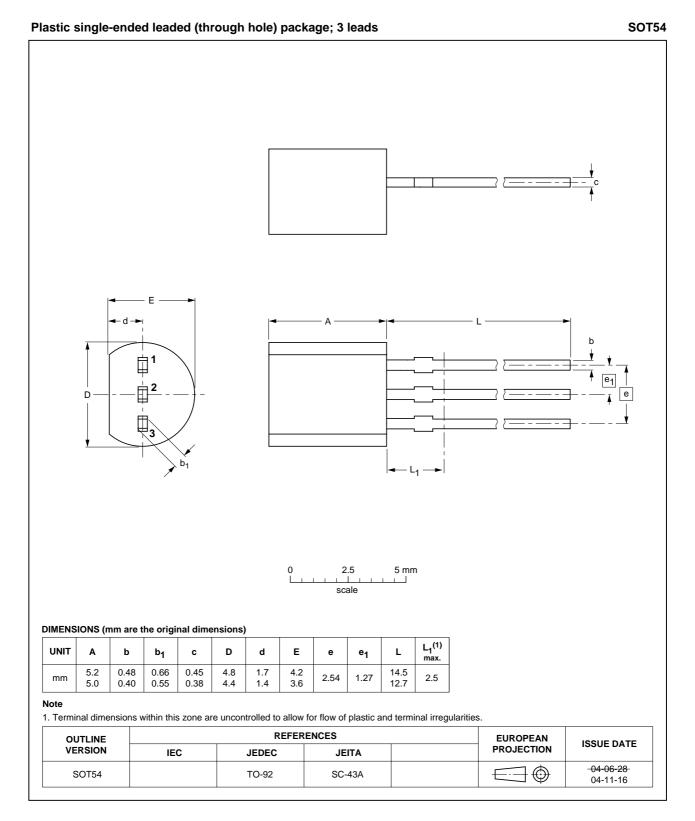




BC546; BC547



PACKAGE OUTLINE



BC546; BC547

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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Notes

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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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