

NPN general purpose transistors

BC546; BC547

FEATURES

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

APPLICATIONS

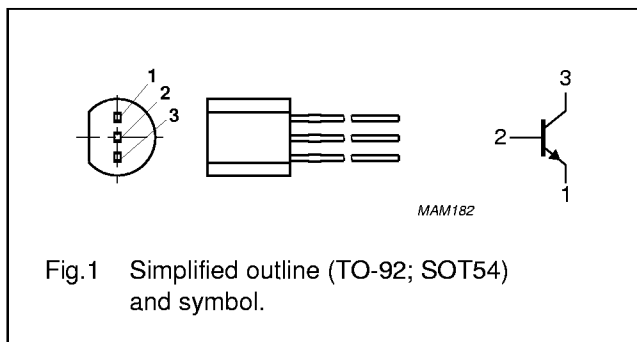
- General purpose switching and amplification.

DESCRIPTION

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

PINNING

PIN	DESCRIPTION
1	emitter
2	base
3	collector



LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{CBO}	collector-base voltage	open emitter	—	80	V
	BC546		—	50	V
	BC547		—	50	V
V_{CEO}	collector-emitter voltage	open base	—	65	V
	BC546		—	45	V
	BC547		—	45	V
V_{EBO}	emitter-base voltage	open collector	—	6	V
	BC546		—	6	V
	BC547		—	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	$T_{amb} \leq 25\text{ °C}$; note 1	—	500	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.

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THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-a}$	thermal resistance from junction to ambient	note 1	0.25	K/mW

Note

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

CHARACTERISTICS

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

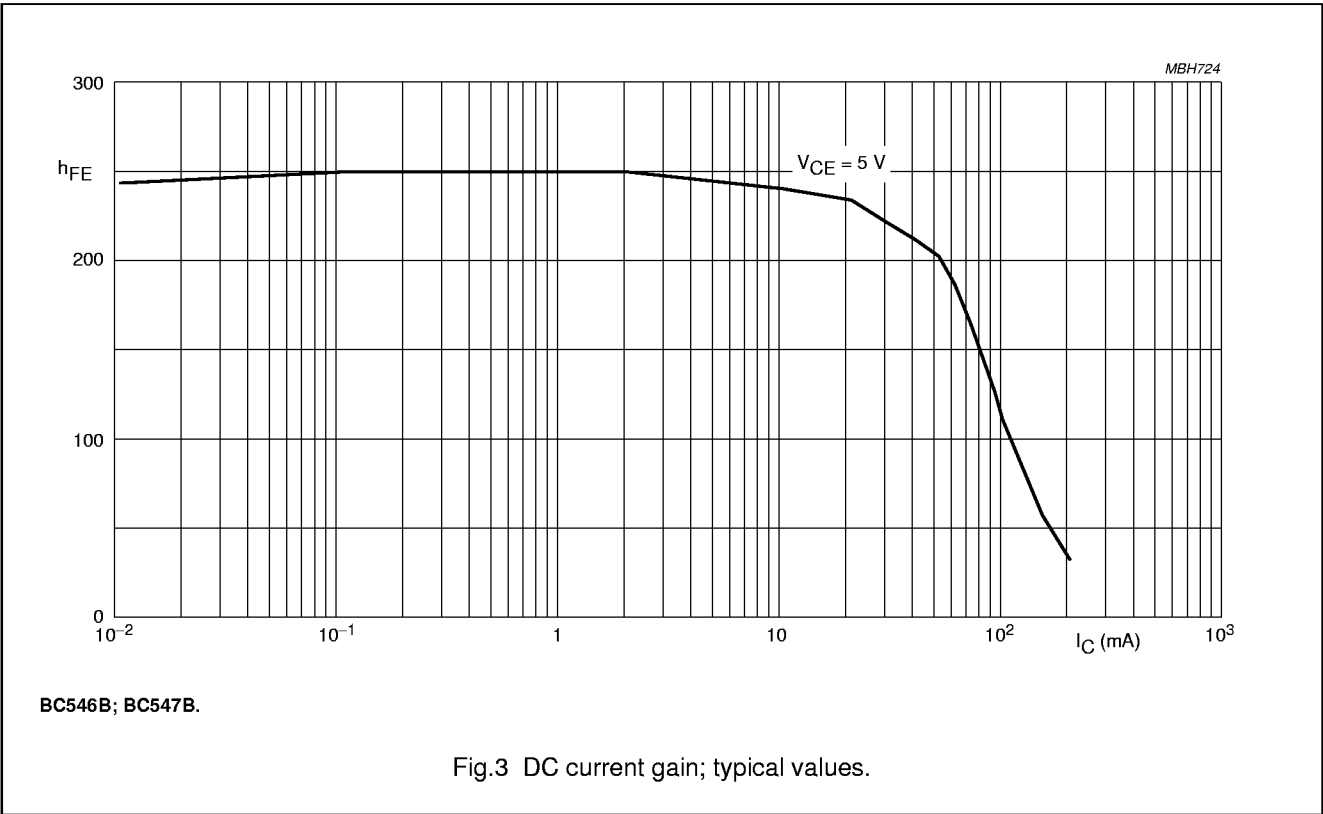
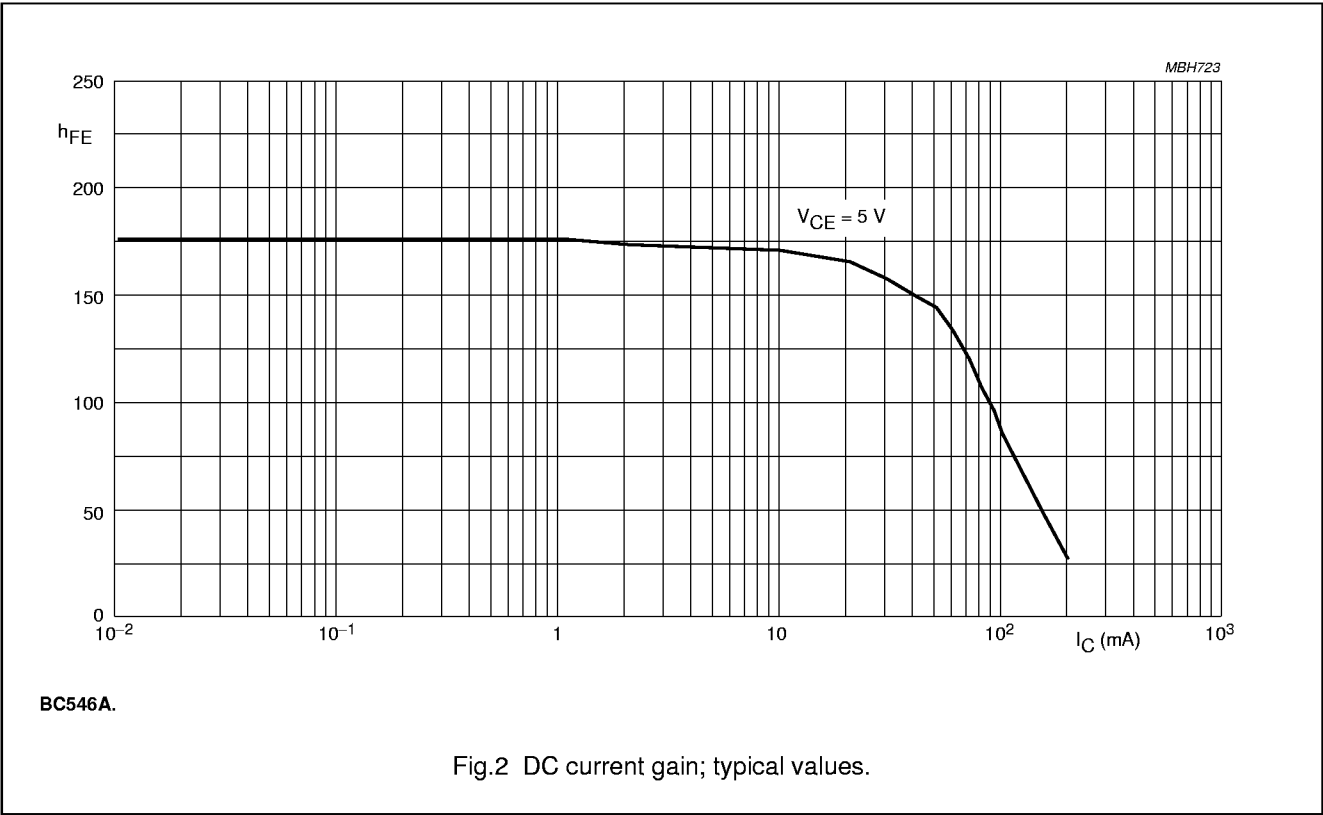
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_{CBO}	collector cut-off current	$I_E = 0; V_{CB} = 30\text{ V}$	—	—	15	nA
		$I_E = 0; V_{CB} = 30\text{ V}; T_j = 150\text{ °C}$	—	—	5	μA
I_{EBO}	emitter cut-off current	$I_C = 0; V_{EB} = 5\text{ V}$	—	—	100	nA
h_{FE}	DC current gain BC546A	$I_C = 10\text{ }\mu\text{A}; V_{CE} = 5\text{ V};$ see Figs 2, 3 and 4	—	90	—	
	BC546B; BC547B		—	150	—	
	BC547C		—	270	—	
	DC current gain BC546A	$I_C = 2\text{ mA}; V_{CE} = 5\text{ V};$ see Figs 2, 3 and 4	110	180	220	
	BC546B; BC547B		200	290	450	
	BC547C		420	520	800	
	BC547		110	—	800	
	BC546		110	—	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	$I_C = 2\text{ mA}; V_{CE} = 5\text{ V};$ note 2	580	660	700	mV
		$I_C = 10\text{ mA}; V_{CE} = 5\text{ V}$	—	—	770	mV
C_c	collector capacitance	$I_E = I_C = 0; V_{CB} = 10\text{ V}; f = 1\text{ MHz}$	—	1.5	—	pF
C_e	emitter capacitance	$I_C = I_E = 0; V_{EB} = 0.5\text{ V}; f = 1\text{ MHz}$	—	11	—	pF
f_T	transition frequency	$I_C = 10\text{ mA}; V_{CE} = 5\text{ V}; f = 100\text{ MHz}$	100	—	—	MHz
F	noise figure	$I_C = 200\text{ }\mu\text{A}; V_{CE} = 5\text{ V};$ $R_S = 2\text{ k}\Omega; f = 1\text{ kHz}; B = 200\text{ Hz}$	—	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.

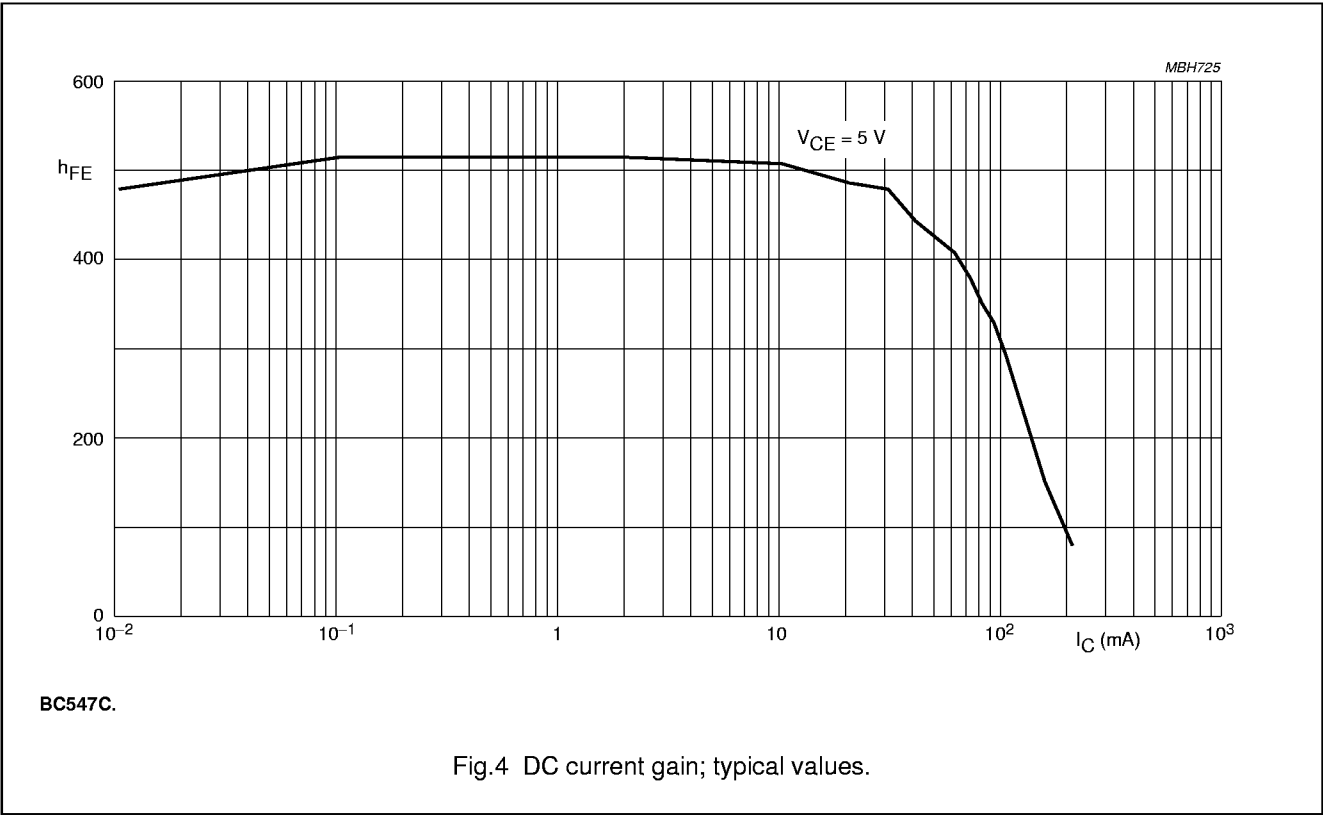
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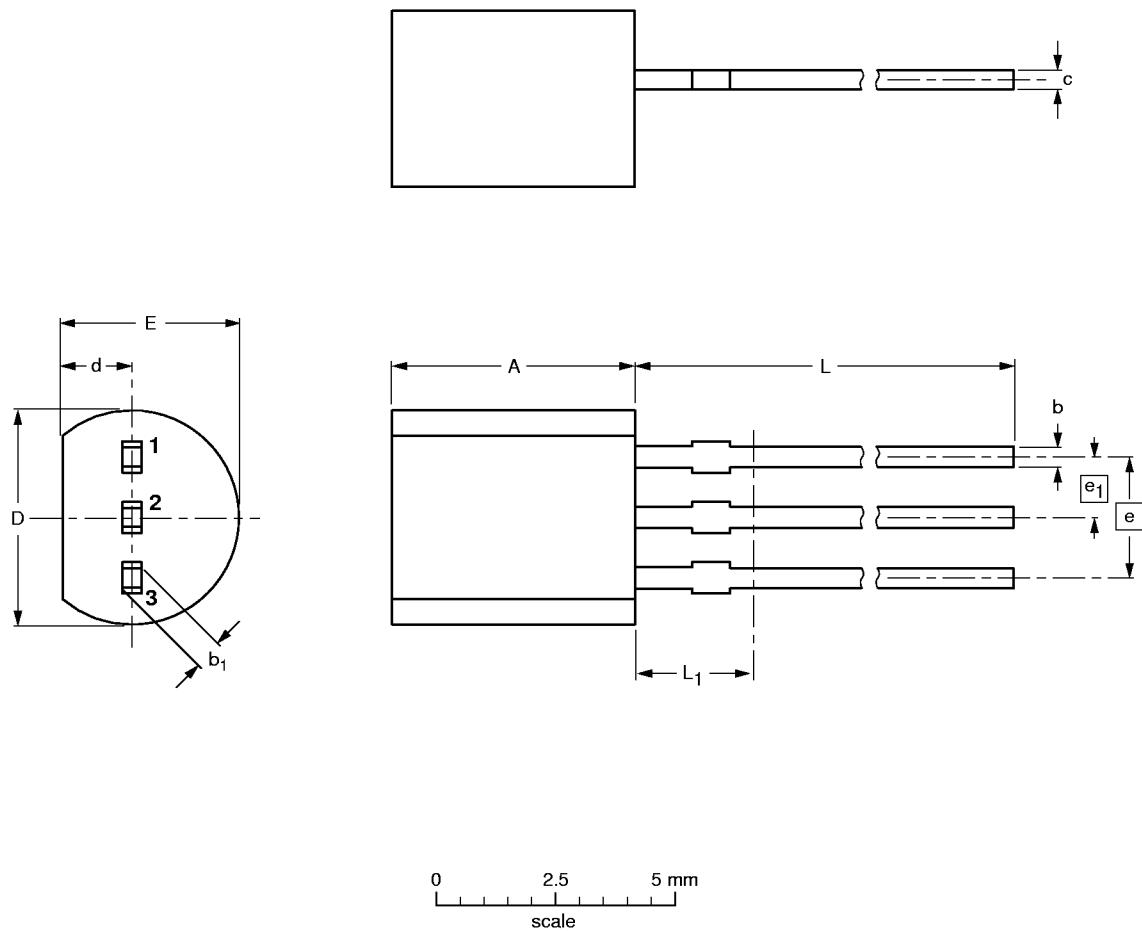
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PACKAGE OUTLINE

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⁾
mm	5.2 5.0	0.48 0.40	0.66 0.56	0.45 0.40	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	EIAJ			
SOT54		TO-92	SC-43			97-02-28