

NPN general purpose transistors BC546; BC547

Features

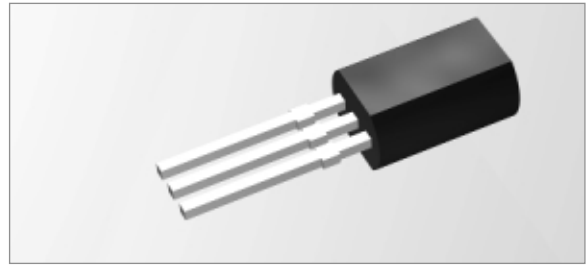
- Low current (max. 100 mA)
- Low voltage (max. 65 V)

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

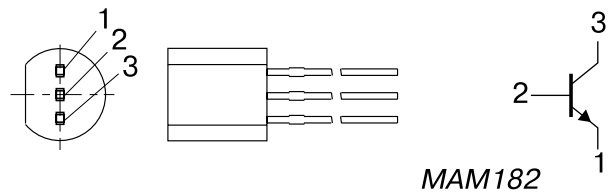


Fig.1 Simplified outline (TO-92; SOT54) and symbol.

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			
	BC546		–	80	V
	BC547		–	50	V
V_{CEO}	collector-emitter voltage	open base			
	BC546		–	65	V
	BC547		–	45	V
V_{EBO}	emitter-base voltage	open collector			
	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

Thermal Characteristics

Symbol	Parameter	Conditions	Value	Unit
R_{thj-a}	thermal resistance from junction to ambient	note 1	0.25	K/mW

Note

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

Characteristics

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

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

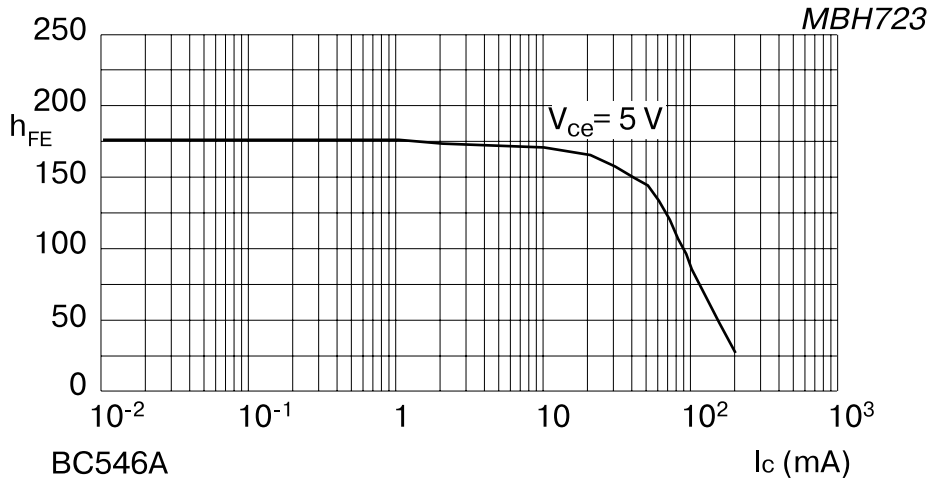


Fig.2 DC current gain; typical values.

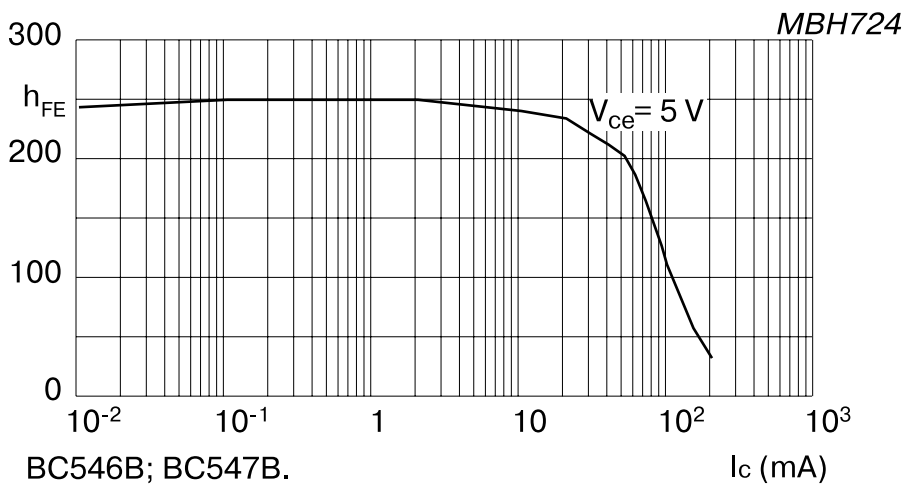


Fig.3 DC current gain; typical values.

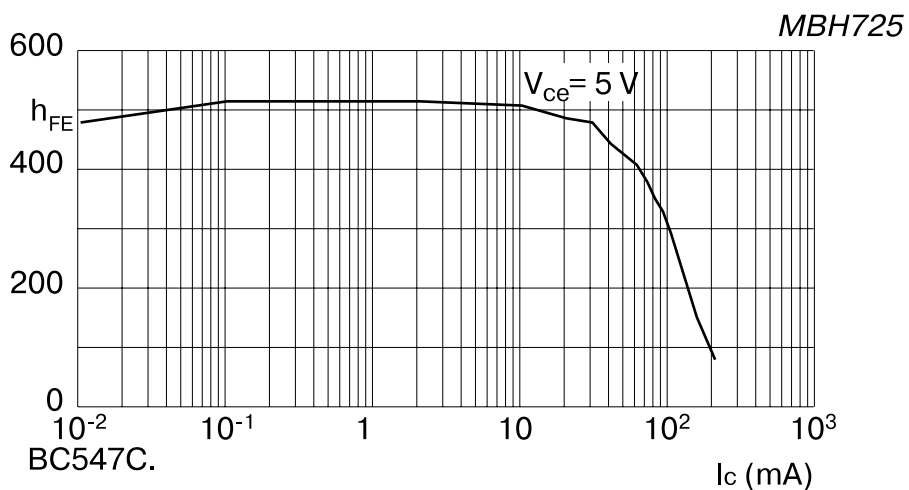
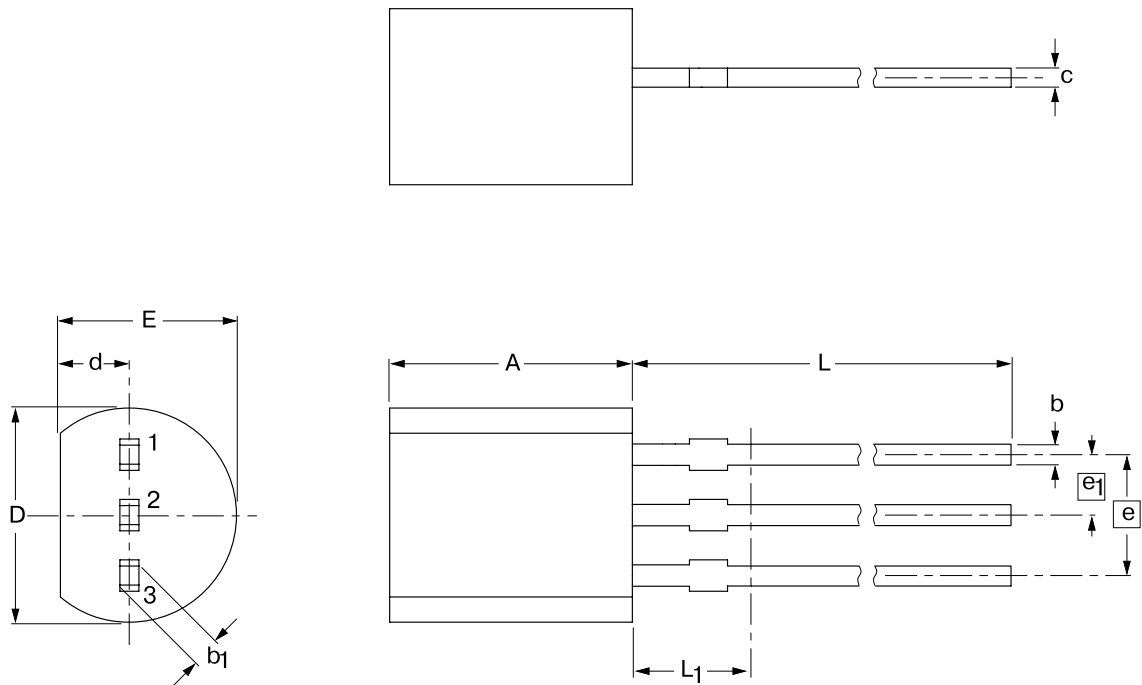


Fig.4 DC current gain; typical values.

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	0.48	0.66	0.45	4.8	1.7	4.2	2.54	1.27	14.5	2.5
	5.0	0.40	0.56	0.40	4.4	1.4	3.6			12.7	

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