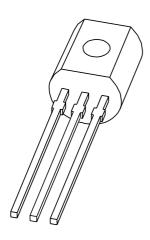
DISCRETE SEMICONDUCTORS

DATA SHEET



BC546; BC547 NPN general purpose transistors

Product specification
Supersedes data of 1997 Mar 04

1999 Apr 15





NPN general purpose transistors

BC546; BC547

FEATURES

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

APPLICATIONS

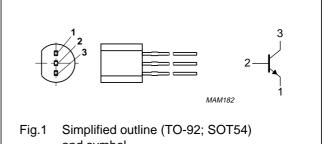
• General purpose switching and amplification.

DESCRIPTION

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

PINNING

PIN	DESCRIPTION		
1	emitter		
2	base		
3	collector		



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} ≤ 25 °C; note 1	_	500	mW
T _{stg}	storage temperature		-65	+150	°C
Tj	junction temperature		_	150	°C
T _{amb}	operating ambient temperature		-65	+150	°C

Note

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

NPN general purpose transistors

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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

 $T_j = 25$ °C unless otherwise specified.

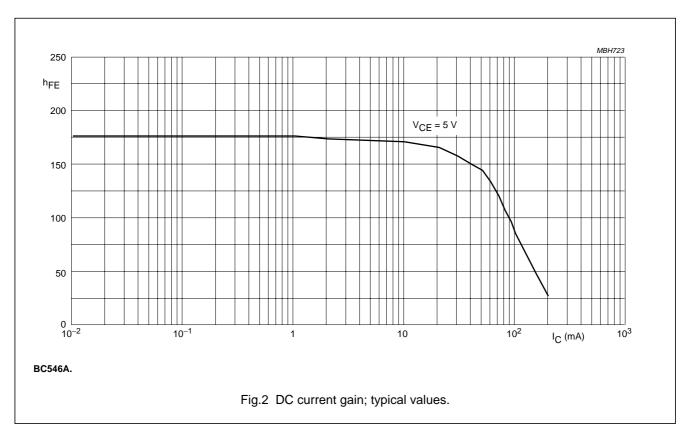
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I _{CBO}	collector cut-off current	I _E = 0; V _{CB} = 30 V	_	_	15	nA
		I _E = 0; V _{CB} = 30 V; T _j = 150 °C	_	_	5	μΑ
I _{EBO}	emitter cut-off current	I _C = 0; V _{EB} = 5 V	_	_	100	nA
h _{FE}	DC current gain	$I_C = 10 \mu A; V_{CE} = 5 V;$				
	BC546A	see Figs 2, 3 and 4	_	90	_	
	BC546B; BC547B		_	150	_	
	BC547C		_	270	_	
	DC current gain	$I_C = 2 \text{ mA}; V_{CE} = 5 \text{ V};$				
	BC546A	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	$I_C = 10 \text{ mA}; I_B = 0.5 \text{ mA}$	_	90	250	mV
	voltage	I _C = 100 mA; I _B = 5 mA	_	200	600	mV
V _{BEsat}	base-emitter saturation voltage	$I_C = 10 \text{ mA}$; $I_B = 0.5 \text{ mA}$; note 1	_	700	_	mV
		I _C = 100 mA; I _B = 5 mA; note 1	_	900	_	mV
V _{BE}	base-emitter voltage	I _C = 2 mA; V _{CE} = 5 V; note 2	580	660	700	mV
		I _C = 10 mA; V _{CE} = 5 V	_	_	770	mV
C _c	collector capacitance	$I_E = i_e = 0$; $V_{CB} = 10 \text{ V}$; $f = 1 \text{ MHz}$	_	1.5	_	pF
C _e	emitter capacitance	$I_C = I_c = 0$; $V_{EB} = 0.5 \text{ V}$; $f = 1 \text{ MHz}$	_	11	_	pF
f _T	transition frequency	I _C = 10mA; V _{CE} = 5 V; 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		2	10	dB

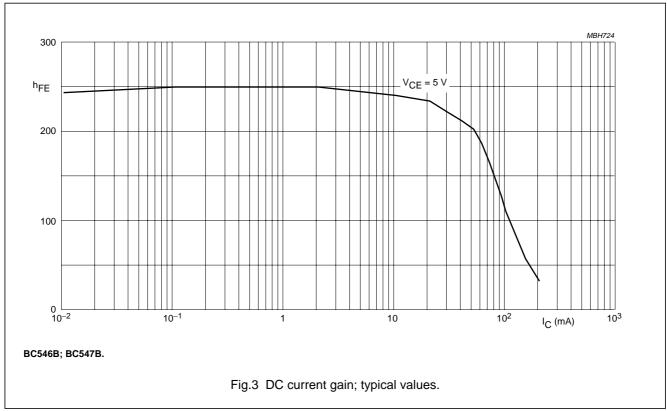
Notes

- 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.

NPN general purpose transistors

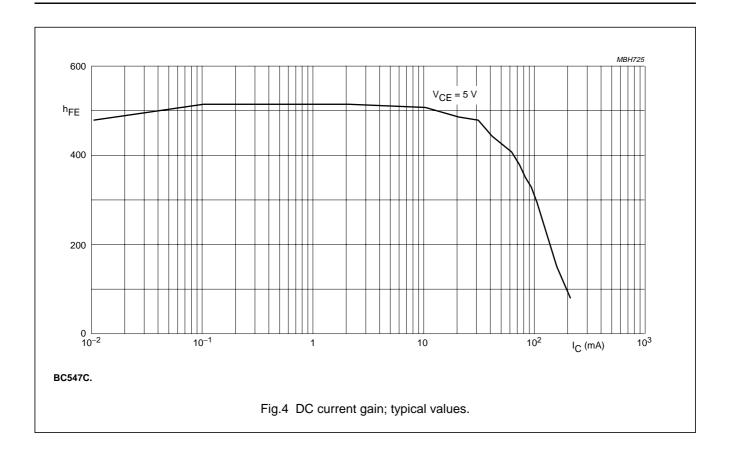
BC546; BC547





NPN general purpose transistors

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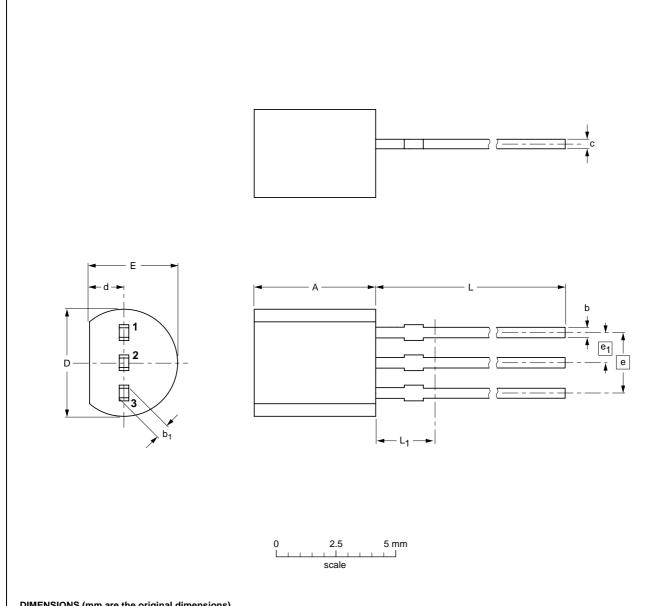
NPN general purpose transistors

BC546; BC547

PACKAGE OUTLINE

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

SOT54



DIMENSIONS (mm are the original dimensions)

UNIT	Α	b	b ₁	С	D	d	E	е	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		REFERENCES			EUROPEAN	ISSUE DATE	
VERSION	IEC	JEDEC	EIAJ		PROJECTION	ISSUE DATE	
SOT54		TO-92	SC-43			97-02-28	

NPN general purpose transistors

BC546; BC547

DEFINITIONS

Data Sheet Status	
Objective specification	This data sheet contains target or goal specifications for product development.
Preliminary specification	This data sheet contains preliminary data; supplementary data may be published later.
Product specification	This data sheet contains final product specifications.
Line Min and a second	

Limiting values

Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). 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.

Application information

Where application information is given, it is advisory and does not form part of the specification.

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