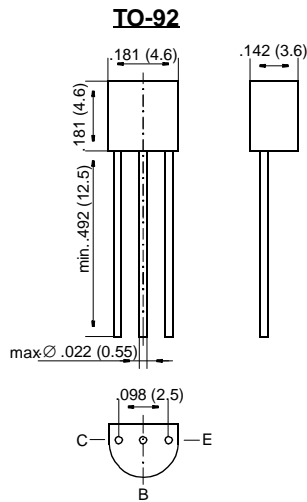


# BC546 THRU BC549

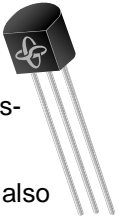
## Small Signal Transistors (NPN)



Dimensions in inches and (millimeters)

### FEATURES

- ◆ NPN Silicon Epitaxial Planar Transistors
- ◆ These transistors are subdivided into three groups A, B and C according to their current gain. The type BC546 is available in groups A and B, however, the types BC547 and BC548 can be supplied in all three groups. The BC549 is a low-noise type and available in groups B and C. As complementary types, the PNP transistors BC556 ... BC559 are recommended.
- ◆ On special request, these transistors are also manufactured in the pin configuration TO-18.



### MECHANICAL DATA

**Case:** TO-92 Plastic Package

**Weight:** approx. 0.18 g

## MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Ratings at 25 °C ambient temperature unless otherwise specified

		Symbol	Value	Unit
Collector-Base Voltage	BC546	$V_{CBO}$	80	V
	BC547	$V_{CBO}$	50	V
	BC548, BC549	$V_{CBO}$	30	V
Collector-Emitter Voltage	BC546	$V_{CES}$	80	V
	BC547	$V_{CES}$	50	V
	BC548, BC549	$V_{CES}$	30	V
Collector-Emitter Voltage	BC546	$V_{CEO}$	65	V
	BC547	$V_{CEO}$	45	V
	BC548, BC549	$V_{CEO}$	30	V
Emitter-Base Voltage	BC546, BC547 BC548, BC549	$V_{EBO}$	6	V
		$V_{EBO}$	5	V
Collector Current		$I_C$	100	mA
Peak Collector Current		$I_{CM}$	200	mA
Peak Base Current		$I_{BM}$	200	mA
Peak Emitter Current		$-I_{EM}$	200	mA
Power Dissipation at $T_{amb} = 25\text{ °C}$		$P_{tot}$	500 <sup>1)</sup>	mW
Junction Temperature		$T_j$	150	°C
Storage Temperature Range		$T_S$	-65 to +150	°C

<sup>1)</sup> Valid provided that leads are kept at ambient temperature at a distance of 2 mm from case

# BC546 THRU BC549

## ELECTRICAL CHARACTERISTICS

	Symbol	Min.	Typ.	Max.	Unit
h-Parameters at $V_{CE} = 5\text{ V}$ , $I_C = 2\text{ mA}$ , $f = 1\text{ kHz}$ , Small Signal Current Gain					
Input Impedance	Current Gain Group A	$h_{fe}$	—	220	—
	B	$h_{fe}$	—	330	—
	C	$h_{fe}$	—	600	—
	Current Gain Group A	$h_{ie}$	1.6	2.7	4.5 $k\Omega$
	B	$h_{ie}$	3.2	4.5	8.5 $k\Omega$
	C	$h_{ie}$	6	8.7	15 $k\Omega$
	Output Admittance	Current Gain Group A	$h_{oe}$	—	18 $\mu S$
	B	$h_{oe}$	—	30	60 $\mu S$
	C	$h_{oe}$	—	60	110 $\mu S$
Reverse Voltage Transfer Ratio	Current Gain Group A	$h_{re}$	—	$1.5 \cdot 10^{-4}$	—
	B	$h_{re}$	—	$2 \cdot 10^{-4}$	—
	C	$h_{re}$	—	$3 \cdot 10^{-4}$	—
DC Current Gain at $V_{CE} = 5\text{ V}$ , $I_C = 10\mu A$					
	Current Gain Group A	$h_{FE}$	—	90	—
	B	$h_{FE}$	—	150	—
	C	$h_{FE}$	—	270	—
at $V_{CE} = 5\text{ V}$ , $I_C = 2\text{ mA}$					
	Current Gain Group A	$h_{FE}$	110	180	220
	B	$h_{FE}$	200	290	450
	C	$h_{FE}$	420	500	800
at $V_{CE} = 5\text{ V}$ , $I_C = 100\text{ mA}$					
	Current Gain Group A	$h_{FE}$	—	120	—
	B	$h_{FE}$	—	200	—
	C	$h_{FE}$	—	400	—
Thermal Resistance Junction to Ambient Air	$R_{thJA}$	—	—	250 <sup>1)</sup>	K/W
Collector Saturation Voltage at $I_C = 10\text{ mA}$ , $I_B = 0.5\text{ mA}$ at $I_C = 100\text{ mA}$ , $I_B = 5\text{ mA}$	$V_{CEsat}$	—	80	200	mV
	$V_{CEsat}$	—	200	600	mV
Base Saturation Voltage at $I_C = 10\text{ mA}$ , $I_B = 0.5\text{ mA}$ at $I_C = 100\text{ mA}$ , $I_B = 5\text{ mA}$	$V_{BEsat}$	—	700	—	mV
	$V_{BEsat}$	—	900	—	mV
Base-Emitter Voltage at $V_{CE} = 5\text{ V}$ , $I_C = 2\text{ mA}$ at $V_{CE} = 5\text{ V}$ , $I_C = 10\text{ mA}$	$V_{BE}$	580	660	700	mV
	$V_{BE}$	—	—	720	mV
Collector-Emitter Cutoff Current at $V_{CE} = 80\text{ V}$ at $V_{CE} = 50\text{ V}$  at $V_{CE} = 30\text{ V}$  at $V_{CE} = 80\text{ V}$ , $T_j = 125\text{ }^\circ\text{C}$ at $V_{CE} = 50\text{ V}$ , $T_j = 125\text{ }^\circ\text{C}$	BC546 $I_{CES}$	—	0.2	15	nA
	BC547 $I_{CES}$	—	0.2	15	nA
	BC548, BC549 $I_{CES}$	—	0.2	15	nA
	BC546 $I_{CES}$	—	—	4	$\mu A$
	BC547 $I_{CES}$	—	—	4	$\mu A$

<sup>1)</sup> Valid provided that leads are kept at ambient temperature at a distance of 2 mm from case

# BC546 THRU BC549

## ELECTRICAL CHARACTERISTICS

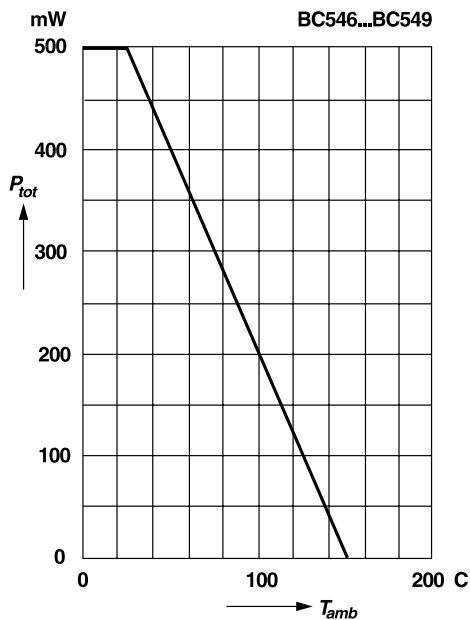
Ratings at 25 °C ambient temperature unless otherwise specified

	Symbol	Min.	Typ.	Max.	Unit
at $V_{CE} = 30 \text{ V}$ , $T_j = 125 \text{ °C}$ <b>BC548, BC549</b>	$I_{CES}$	—	—	4 4	$\mu\text{A}$ $\mu\text{A}$
Gain-Bandwidth Product at $V_{CE} = 5 \text{ V}$ , $I_C = 10 \text{ mA}$ , $f = 100 \text{ MHz}$	$f_T$	—	300	—	MHz
Collector-Base Capacitance at $V_{CB} = 10 \text{ V}$ , $f = 1 \text{ MHz}$	$C_{CBO}$	—	3.5	6	pF
Emitter-Base Capacitance at $V_{EB} = 0.5 \text{ V}$ , $f = 1 \text{ MHz}$	$C_{EBO}$	—	9	—	pF
Noise Figure at $V_{CE} = 5 \text{ V}$ , $I_C = 200 \mu\text{A}$ , $R_G = 2 \text{ k}\Omega$ , $f = 1 \text{ kHz}$ , $\Delta f = 200 \text{ Hz}$ <b>BC546, BC547</b>	F	—	2	10	dB
<b>BC548</b>	F	—	1.2	4	dB
<b>BC549</b>	F	—	1.4	4	dB

## RATINGS AND CHARACTERISTIC CURVES BC546 THRU BC549

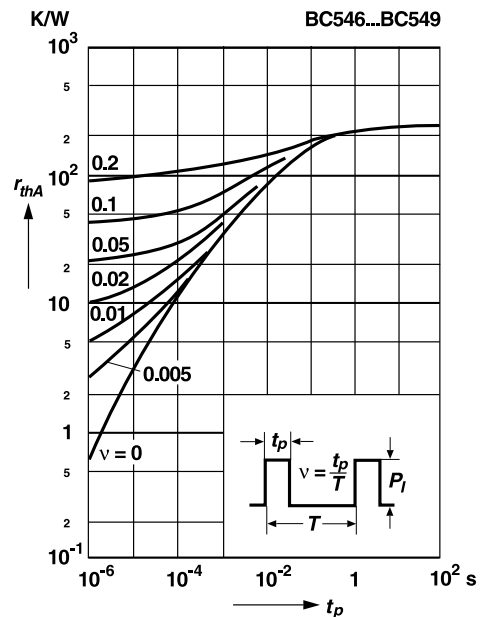
### Admissible power dissipation versus temperature

Valid provided that leads are kept at ambient  
temperature at a distance of 2 mm from case



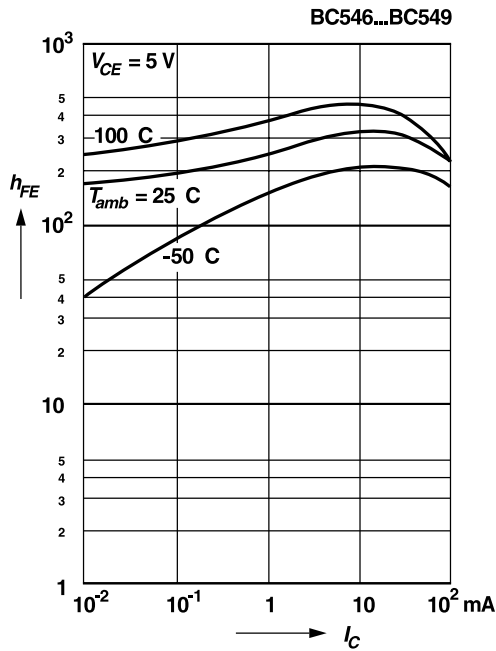
### Pulse thermal resistance versus pulse duration

Valid provided that leads are kept at ambient  
temperature at a distance of 2 mm from case

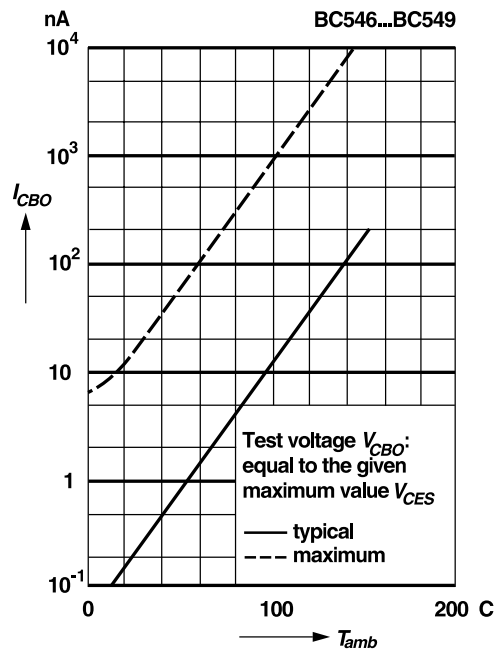


# RATINGS AND CHARACTERISTIC CURVES BC546 THRU BC549

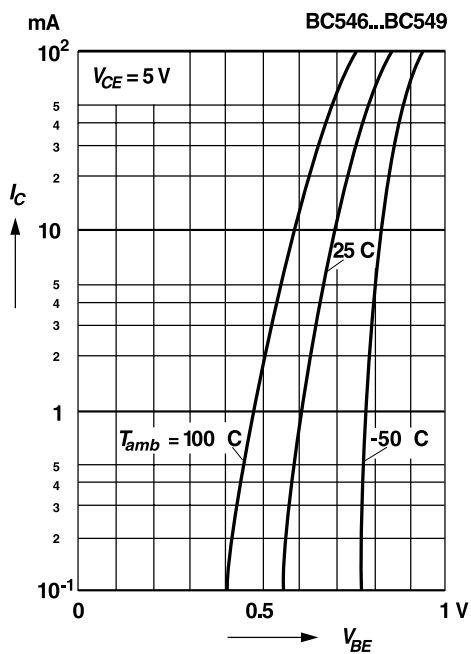
DC current gain  
versus collector current



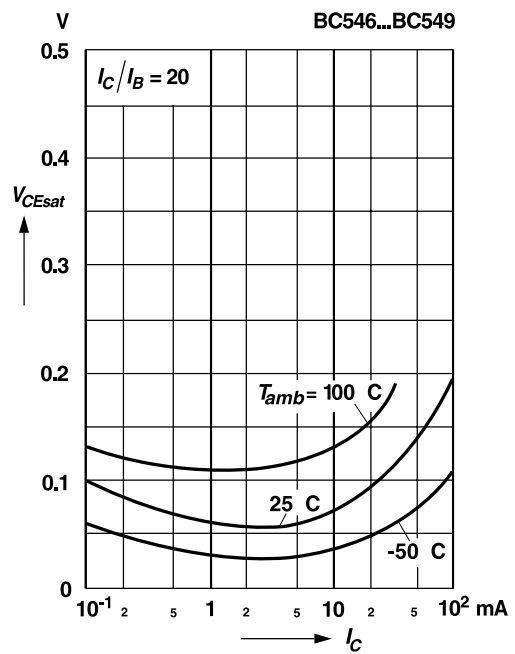
Collector-base cutoff current  
versus ambient temperature



Collector current versus  
base-emitter voltage

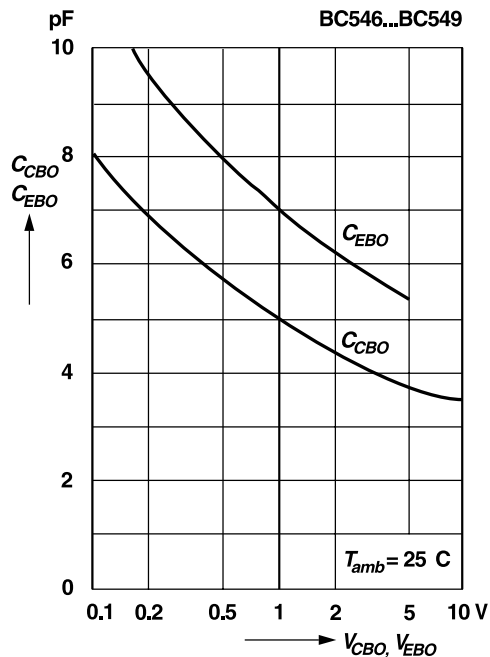


Collector saturation voltage  
versus collector current

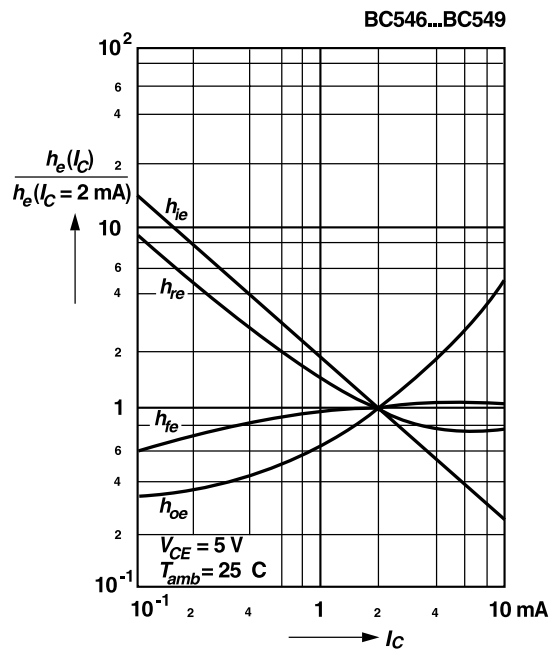


# RATINGS AND CHARACTERISTIC CURVES BC546 THRU BC549

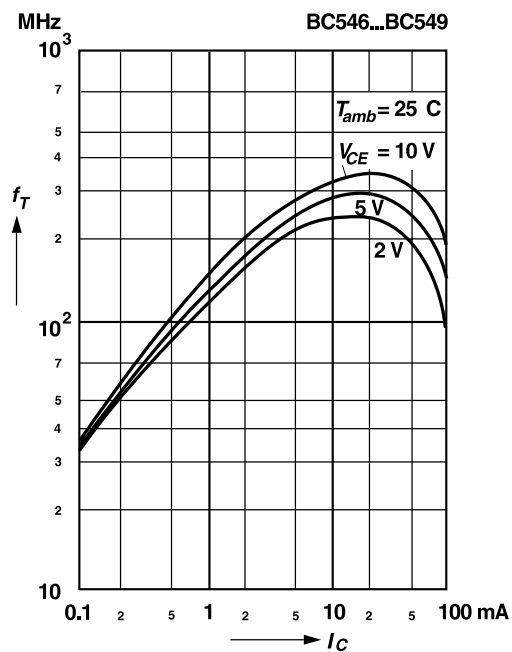
Collector-base capacitance,  
Emitter-base capacitance  
versus reverse bias voltage



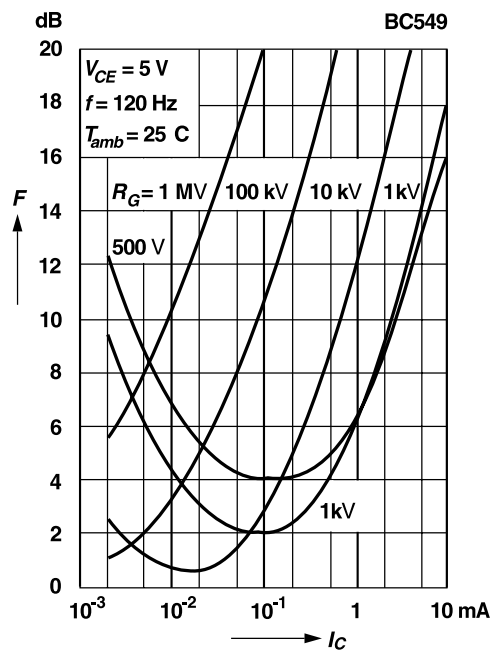
Relative h-parameters  
versus collector current



Gain-bandwidth product  
versus collector current

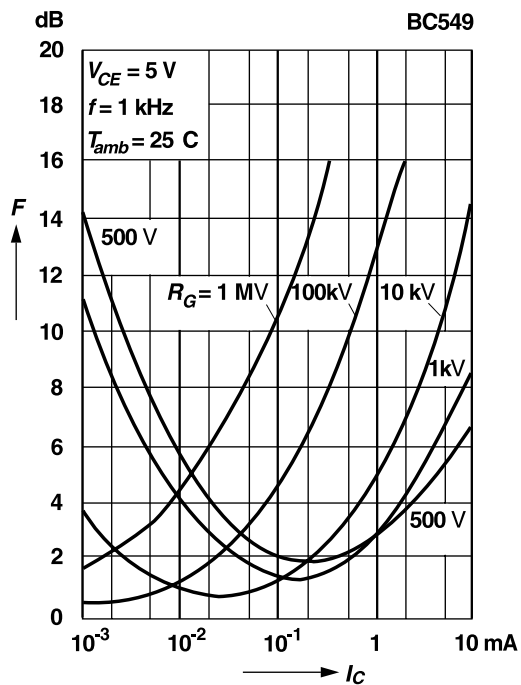


Noise figure  
versus collector current



# RATINGS AND CHARACTERISTIC CURVES BC546 THRU BC549

Noise figure  
versus collector current



Noise figure  
versus collector emitter voltage

