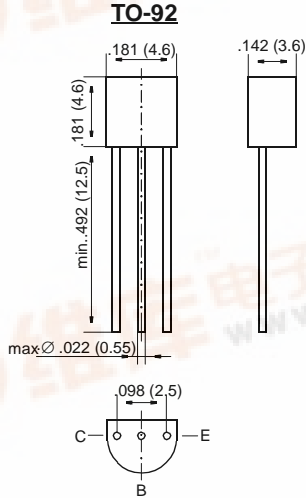


BC546 THRU BC549

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_{CB0}	80	V
	BC547	V_{CB0}	50	V
	BC548, BC549	V_{CB0}	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	V_{EBO}	6	V
	BC548, BC549	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 ¹⁾	mW
Junction Temperature		T_j	150	°C
Storage Temperature Range		T_S	-65 to +150	°C

¹⁾ 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					
Current Gain Group A	h_{fe}	–	220	–	–
B	h_{fe}	–	330	–	–
C	h_{fe}	–	600	–	–
Input Impedance 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	30	μS
B	h_{oe}	–	30	60	μS
C	h_{oe}	–	60	110	μS
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 ¹⁾	K/W
Collector Saturation Voltage					
at $I_C = 10\text{ mA}$, $I_B = 0.5\text{ mA}$	V_{CEsat}	–	80	200	mV
at $I_C = 100\text{ mA}$, $I_B = 5\text{ mA}$	V_{CEsat}	–	200	600	mV
Base Saturation Voltage					
at $I_C = 10\text{ mA}$, $I_B = 0.5\text{ mA}$	V_{BEsat}	–	700	–	mV
at $I_C = 100\text{ mA}$, $I_B = 5\text{ mA}$	V_{BEsat}	–	900	–	mV
Base-Emitter Voltage					
at $V_{CE} = 5\text{ V}$, $I_C = 2\text{ mA}$	V_{BE}	580	660	700	mV
at $V_{CE} = 5\text{ V}$, $I_C = 10\text{ mA}$	V_{BE}	–	–	720	mV
Collector-Emitter Cutoff Current					
at $V_{CE} = 80\text{ V}$	I_{CES}	–	0.2	15	nA
at $V_{CE} = 50\text{ V}$	I_{CES}	–	0.2	15	nA
at $V_{CE} = 30\text{ V}$	I_{CES}	–	0.2	15	nA
at $V_{CE} = 80\text{ V}$, $T_j = 125\text{ }^\circ\text{C}$	I_{CES}	–	–	4	μA
at $V_{CE} = 50\text{ V}$, $T_j = 125\text{ }^\circ\text{C}$	I_{CES}	–	–	4	μA

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

BC546 THRU BC549

ELECTRICAL CHARACTERISTICS

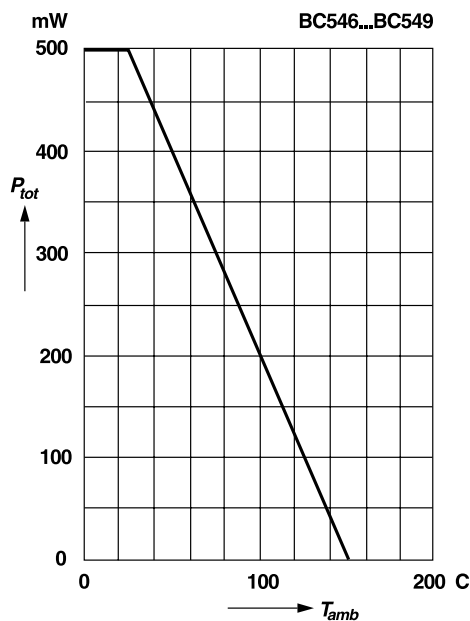
Ratings at 25 °C ambient temperature unless otherwise specified

	Symbol	Min.	Typ.	Max.	Unit
at $V_{CE} = 30\text{ V}$, $T_j = 125\text{ °C}$ BC548, BC549	I_{CES}	–	–	4 4	μA μA
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 $V_{CE} = 5\text{ V}$, $I_C = 200\text{ }\mu\text{A}$, $R_G = 2\text{ k}\Omega$, $f = 1\text{ kHz}$, $\Delta f = 200\text{ Hz}$ BC546, BC547	F	–	2	10	dB
BC548 BC549	F	–	1.2	4	dB
at $V_{CE} = 5\text{ V}$, $I_C = 200\text{ }\mu\text{A}$, $R_G = 2\text{ k}\Omega$, $f = 30\dots 15000\text{ Hz}$ BC549	F	–	1.4	4	dB

RATINGS AND CHARACTERISTIC CURVES BC546 THRU BC549

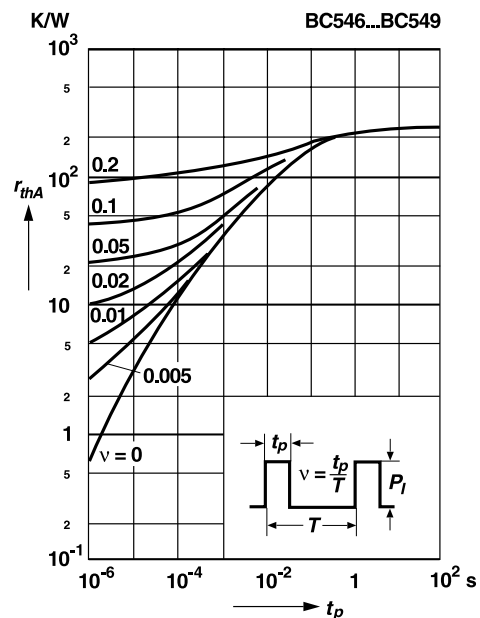
Admissible power dissipation versus temperature

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



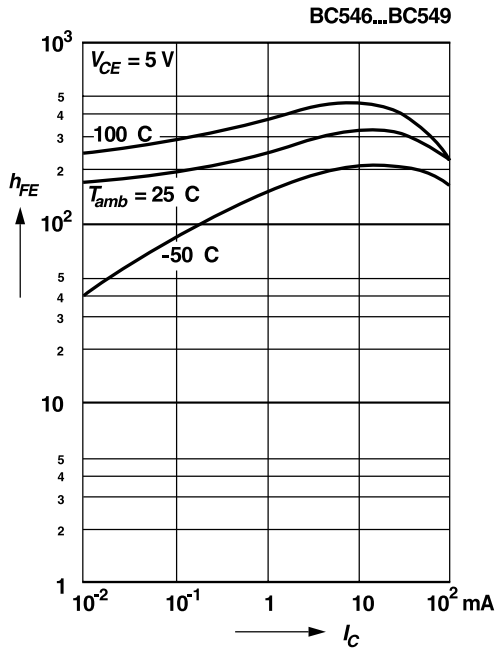
Pulse thermal resistance versus pulse duration

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

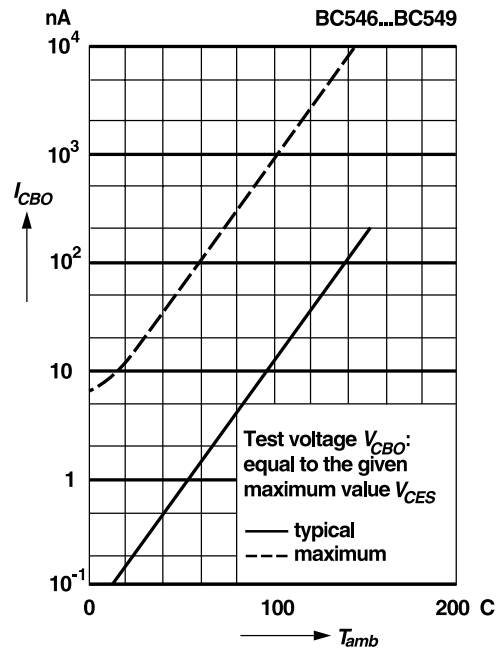


RATINGS AND CHARACTERISTIC CURVES BC546 THRU BC549

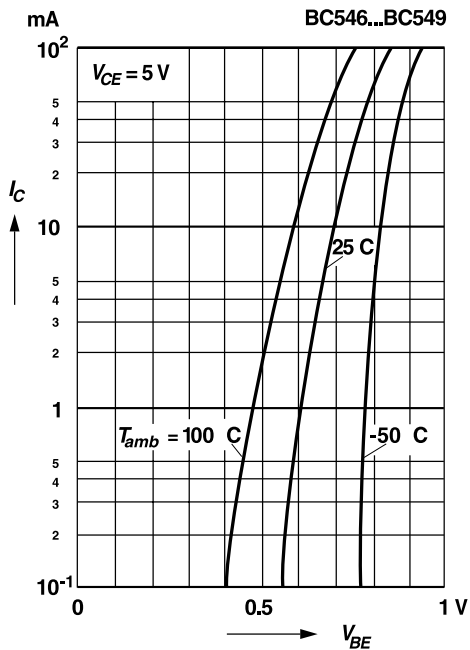
DC current gain versus collector current



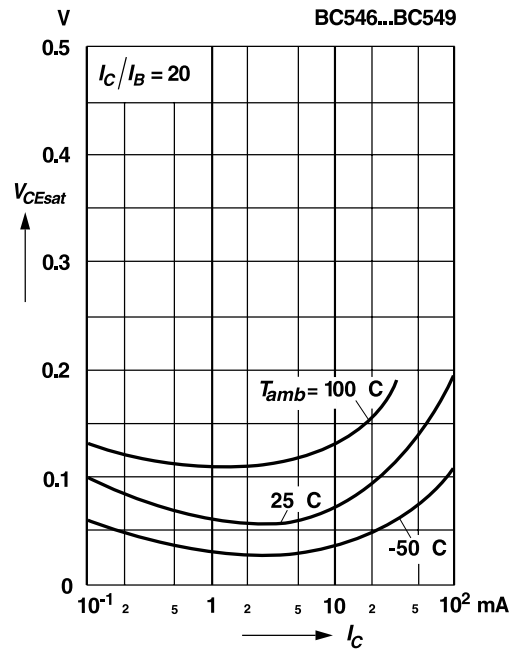
Collector-base cutoff current versus ambient temperature



Collector current versus base-emitter voltage

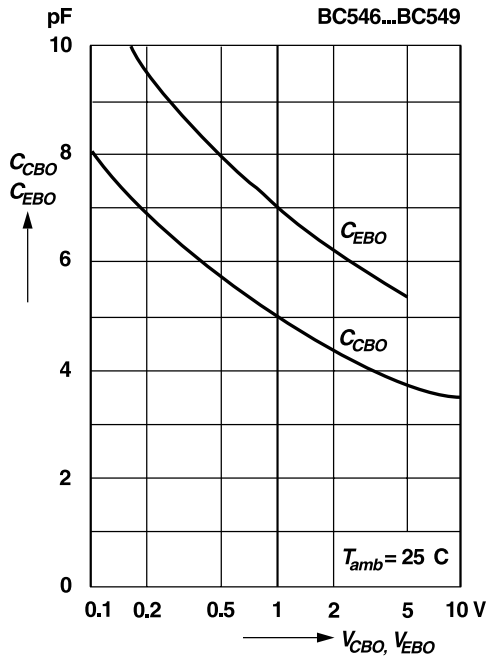


Collector saturation voltage versus collector current

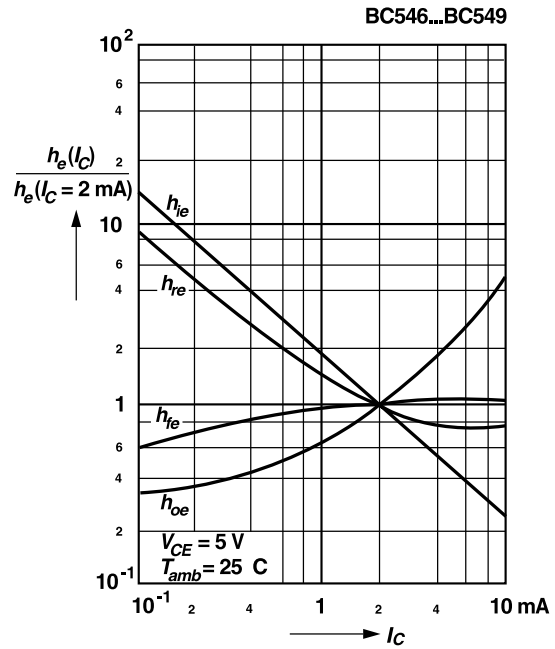


RATINGS AND CHARACTERISTIC CURVES BC546 THRU BC549

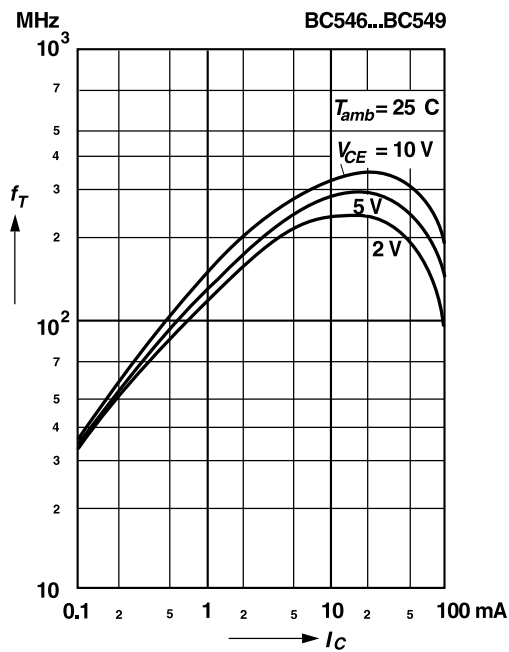
Collector-base capacitance,
Emitter-base capacitance
versus reverse bias voltage



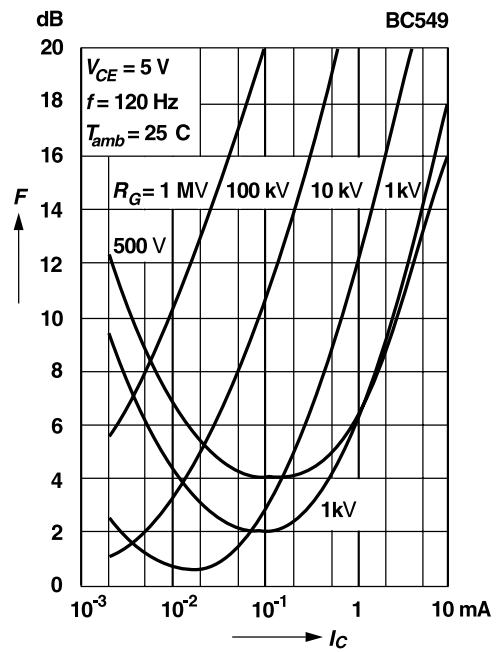
Relative h-parameters
versus collector current



Gain-bandwidth product
versus collector current

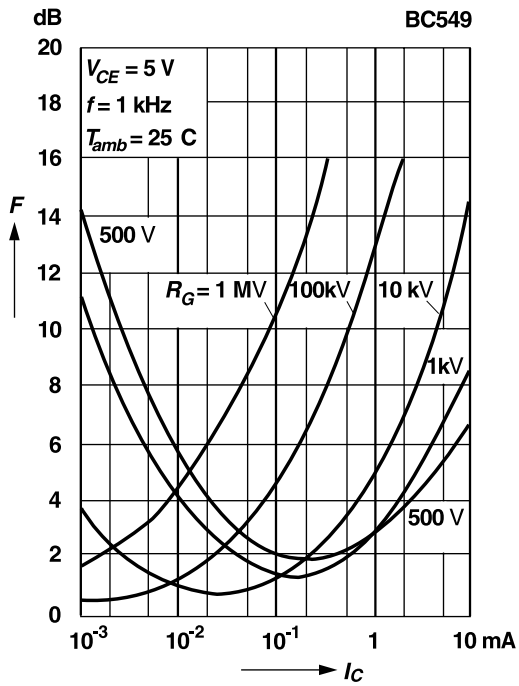


Noise figure
versus collector current



RATINGS AND CHARACTERISTIC CURVES BC546 THRU BC549

Noise figure versus collector current



Noise figure versus collector emitter voltage

