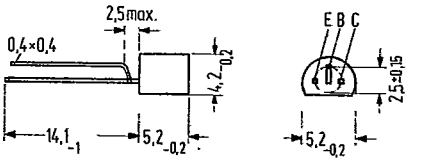
NPN Silicon Transistors

BC 546 – BC 550

BC 546, BC 547, BC 548, BC 549 and BC 550 are epitaxial NPN silicon planar transistors in TO 92 plastic packages (10 A 3 DIN 41868). They are intended for use in AF input and driver stages (BC 549; BC 550 for low-noise input stages) and as complementary transistors to BC 556, BC 557, BC 558, BC 559 and BC 560.

Type	Ordering code
BC 546[1)]	Q62702-C687
BC 546 VI	Q62702-C687-V3
BC 546 A	Q62702-C687-V1
BC 546 B	Q62702-C687-V2
BC 547[1)]	Q62702-C688
BC 547 VI	Q62702-C688-V3
BC 547 A	Q62702-C688-V1
BC 547 B	Q62702-C688-V2
BC 548[1)]	Q62702-C689
BC 548 VI	Q62702-C689-V4
BC 548 A	Q62702-C689-V1
BC 548 B	Q62702-C689-V2
BC 548 C	Q62702-C689-V3

Type	Ordering code
BC 549[1)]	Q62702-C690
BC 549 B	Q62702-C690-V1
BC 549 C	Q62702-C690-V2
BC 550[1)]	Q62702-C691
BC 550 B	Q62702-C691-V1
BC 550 C	Q62702-C691-V2



Mounting instruction: Fixing hole dia 0.6
Approx. weight 0.25 g
Dimensions in mm

Maximum ratings

		BC 546	BC 547	BC 548	BC 549	BC 550	
Collector-base voltage	V_{CBO}	80	50	30	30	50	V
Collector-emitter voltage	V_{CES}	80	50	30	30	50	V
Collector-emitter voltage	V_{CEO}	65	45	30	30	45	V
Emitter-base voltage	V_{EBO}	6	6	5	5	5	V
Collector current	I_C	100	100	100	100	100	mA
Collector peak current	I_{CM}	200	200	200	200	200	mA
Base peak current	I_{BM}	200	200	200	200	200	mA
Emitter-peak current	I_{EM}	200	200	200	200	200	mA
Junction temperature	T_j	150	150	150	150	150	°C
Storage temperature range	T_{stg}	−65 to +150					°C
Total power dissipation (T_{amb} = 25 °C)	P_{tot}	500	500	500	500	500	mW

Thermal resistance

Junction to ambient air	R_{thJA}	≦250	≦250	≦250	≦250	≦250	K/W
Junction to case	R_{thJC}	≦150	≦150	≦150	≦150	≦150	K/W

1) If the order does not include any exact indication of the current amplification group desired, a transistor of a current amplification group just available from stock will be delivered.

Static characteristics (T_{amb} = 25 °C)

The transistors are grouped in accordance with the DC current gain h_{FE} and are marked by A, B, and C. At V_{CE} = 5 V and the collector currents tabulated below the following static characteristics apply.

Type	BC 546 BC 547 BC 548	BC 546 BC 547 BC 548	BC 546 BC 547, BC 549 BC 548, BC 550	BC 548, BC 549, BC 550
h_{FE} group	VI	A	B	C
I_C mA	h_{FE} I_C/I_B	h_{FE} I_C/I_B	h_{FE} I_C/I_B	h_{FE} I_C/I_B
0.01		90	150	270
2	110 (75 to 150)	180 (110 to 220)	290 (200 to 450)	500 (420 to 800)
100		120	200	400

Collector cutoff current (V_{CBO} = 30 V)	I_{CBO}	≦15	nA
Collector cutoff current (V_{CBO} = 30 V; T_{amb} = 150 °C)	I_{CBO}	≦5	µA
Collector-emitter saturation voltage			
(I_C = 10 mA; I_B = 0.5 mA)	V_{CEsat}	90 (<250)	mV
(I_C = 100 mA; I_B = 5 mA)	V_{CEsat}	200 (<600)	mV
(I_C = 10 mA)[1]	V_{CEsat}	300 (<600)	mV
Base-emitter saturation voltage[2]			
(I_C = 10 mA; I_B = 0.5 mA)	V_{BEsat}	700	mV
(I_C = 100 mA; I_B = 5 mA)	V_{BEsat}	900	mV
Base-emitter voltage (V_{CE} = 5 V; I_C = 2 mA)	V_{BE}	660 (580 to 700)	mV
Base-emitter voltage (V_{CE} = 5 V; I_C = 10 mA)	V_{BE}	<720	mV

1) For the characteristic which passes through the point I_C = 11 mA; V_{CE} = 1 V at constant base current.

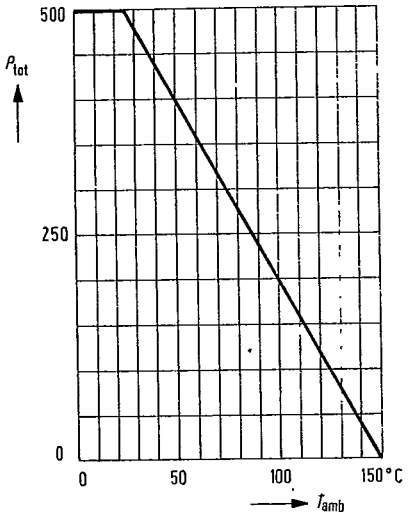
2) $\frac{\Delta V_{BEsat}}{\Delta T_j}$ approx. = 1.7 mV/K; $\frac{\Delta V_{BE}}{\Delta T_j}$ approx. = −2 mV/K

Dynamic characteristics (T_{amb} = 25 °C)		**BC 546 BC 547 BC 548**	**BC 549**	**BC 550**	
Transition frequency (V_{CE} = 5 V; I_C = 10 mA; f = 100 MHz)	f_T	300	300	300	MHz
Collector-base capacitance (V_{CBO} = 10 V; f = 1 MHz)	C_{CBO}	2.5 (<4.5)	2.5 (<4.5)	2.5 (<4.5)	pF
Emitter-base capacitance (V_{EBO} = 0.5 V; f = 1 MHz)	C_{EBO}	9	9	9	pF
Noise figure (V_{CE} = 5 V; I_C = 200 µA; R_g = 2 kΩ; f = 1 kHz; Δ f = 200 Hz)	NF	2 (<10)	1.2 (<4)	1 (<4)	dB
Equivalent noise voltage (V_{CE} = 5 V; I_C = 200 µA; R_g = 2 kΩ; f = 10 to 50 Hz; T_{amb} = 25 °C)	E_n	–	<0.135	<0.135	µV

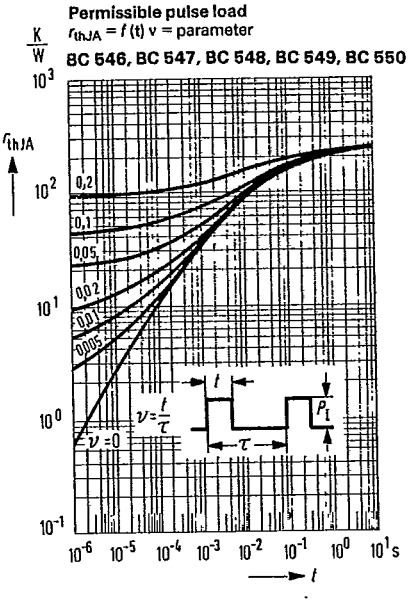
Dynamic characteristics (T_{amb} = 25 °C)
I_C = 2 mA; V_{CE} = 5 V; f = 1 kHz

Type	**BC 546 BC 547 BC 548**	**BC 546 BC 547 BC 548**	**BC 546 BC 547, BC 549 BC 548, BC 550**	**BC 548, BC 549, BC 550**	
h_{FE} group	**VI**	**A**	**B**	**C**	
h_{11e}	1.2 (0.4 to 2.2)	2.7 (1.6 to 4.5)	4.5 (3.2 to 8.5)	8.7 (6 to 15)	kΩ
h_{12e}	2.5	1.5	2	3	10^{-4}
h_{21e}	110	220	330	600	–
h_{22e}	20 (<40)	18 (<30)	30 (<60)	60 (<110)	µS

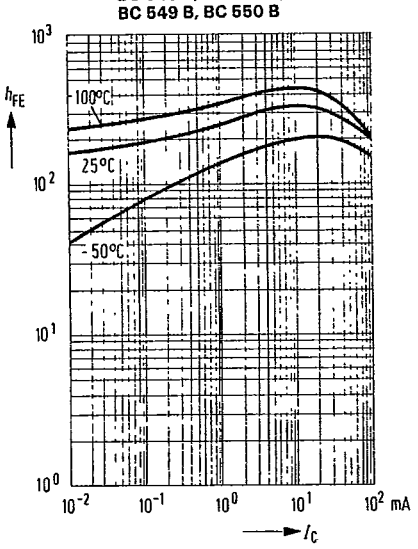
Total perm. power dissipation versus temperature
$P_{tot} = f(T_{amb})$



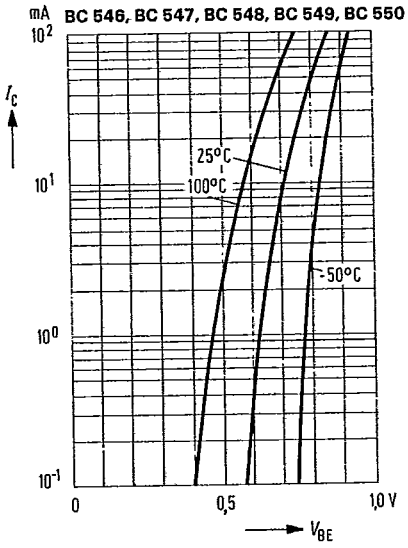
Permissible pulse load
$r_{thJA} = f(t)$ ν = parameter



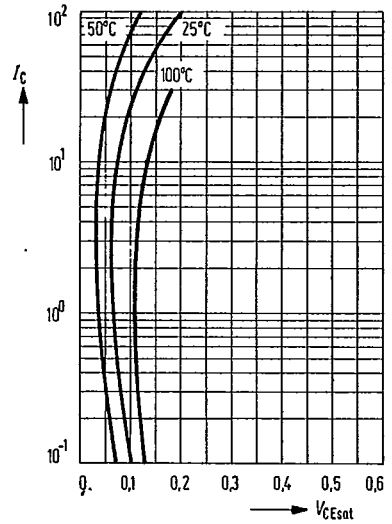
DC current gain $h_{FE} = f(I_C)$
$V_{CE} = 5$ V; T_{amb} = parameter
(common-emitter configuration)
BC 546 B, BC 547 B, BC 548 B, BC 549 B, BC 550 B



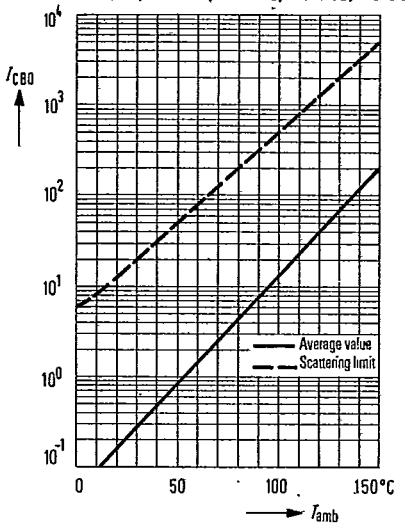
Collector current $I_C = f(V_{BE})$
$V_{CE} = 5$ V
(common-emitter configuration)
BC 546, BC 547, BC 548, BC 549, BC 550



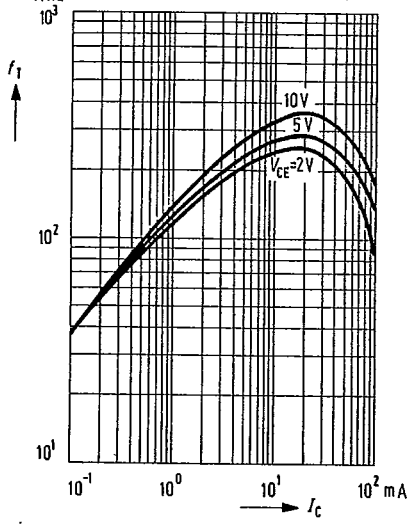
Collector-emitter saturation voltage
$V_{CEsat} = f(I_C)$; $h_{FE} = 20$;
T_{amb} = parameter
(common-emitter configuration)
BC 546, BC 547, BC 548, BC 549, BC 550



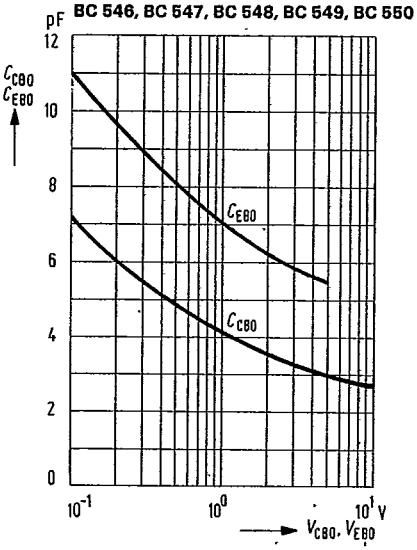
Collector-cutoff current versus temperature $I_{CBO} = f(T_{amb})$ **for max. permissible reverse voltage**
nA **BC 546, BC 547, BC 548, BC 549, BC 550**



Transition frequency $f_T = f(I_C)$
V_{CE} = parameter; T_{amb} = 25°C
MHz **BC 546, BC 547, BC 548, BC 549, BC 550**



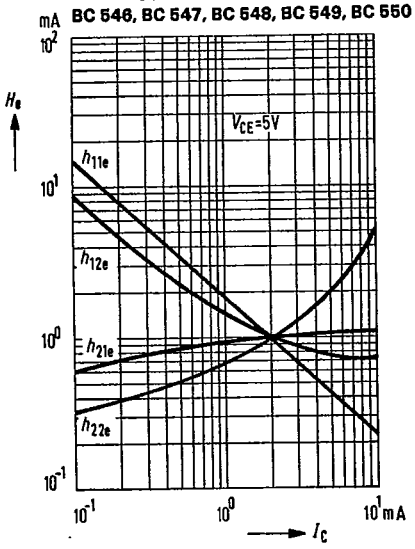
Collector-base capacitance $C_{CBO} = f(V_{CBO})$
Emitter-base capacitance $C_{EBO} = f(V_{EBO})$
pF **BC 546, BC 547, BC 548, BC 549, BC 550**



h-parameter versus collector current

$H_e = \frac{h_e(I_C)}{h_e(I_C = 2\ mA)} = f(I_C)$

BC 546, BC 547, BC 548, BC 549, BC 550

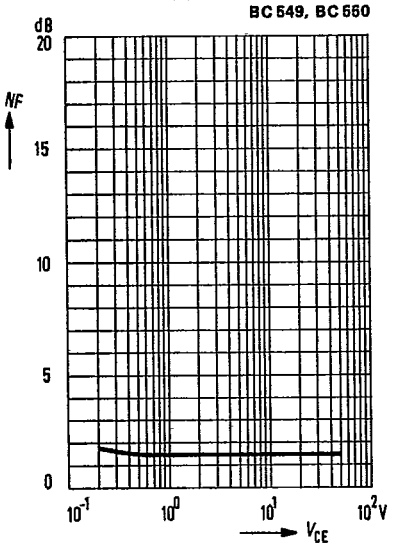


Noise figure $NF = f(V_{CE})$

I_C = 0.2 mA; R_g = 2 kΩ; f = 1 kHz

Δf = 200 Hz; T_{amb} = 25 °C

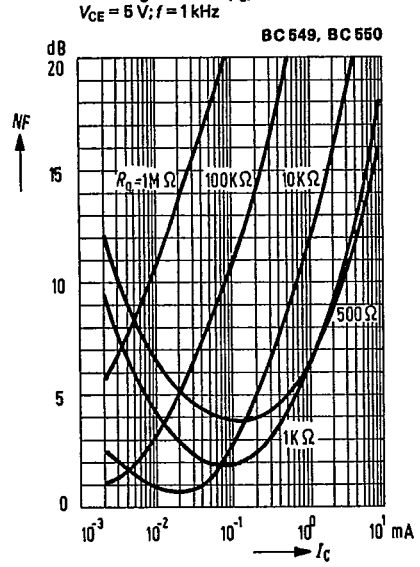
BC 549, BC 550



Noise figure $NF = f(I_C)$

V_{CE} = 5 V; f = 1 kHz

BC 549, BC 550



Noise figure $NF = f(I_C)$

V_{CE} = 5 V; f = 120 Hz

BC 549, BC 550