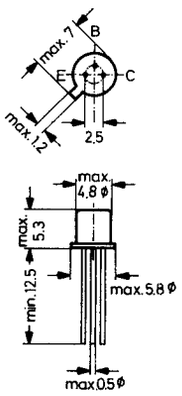
BC107, BC108, BC109

NPN Silicon Epitaxial Planar Transistors
for switching and amplifier applications

The transistors are subdivided into three groups A, B and C according to their current gain. Type BC107 is available in groups A and B, type BC108 in groups A, B and C, and type BC109 in groups B and C.
Type BC109 is a low noise type.



Metal case JEDEC TO-18
18 A 3 according to DIN 41876
Collector connected to case

Weight approximately 0.35 g
Dimensions in mm

Absolute Maximum Ratings

		Symbol	Value	Unit
Collector Emitter Voltage	**BC107**	V_{CES}	50	V
	BC108, BC109	V_{CES}	30	V
Collector Emitter Voltage	**BC107**	V_{CEO}	45	V
	BC108, BC109	V_{CEO}	25	V
Emitter Base Voltage	**BC107**	V_{EBO}	6	V
	BC108, BC109	V_{EBO}	5	V
Collector Current		I_C	100	mA
Peak Collector Current		I_{CM}	200	mA
Base Current		I_B	50	mA
Power Dissipation at T_{amb} = 25 °C		P_{tot}	300	mW
Junction Temperature		T_j	175	°C
Storage Temperature Range		T_S	−55 . . . +175	°C

Characteristics at T_{amb} = 25 °C

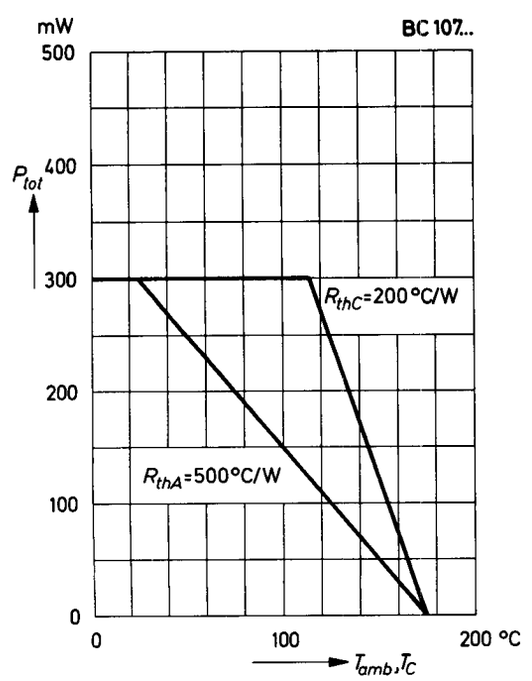
		Symbol	Min.	Typ.	Max.	Unit
h-Parameters at V_{CE} = 5 V, I_C = 2 mA, f = 1 kHz						
Small Signal Current Gain	**Current Gain Group A**	h_{fe}	125	220	260	–
	B	h_{fe}	240	330	500	–
	C	h_{fe}	450	600	900	–
Input Impedance	**Current Gain Group A**	h_{ie}	1.6	2.7	4.5	kΩ
	B	h_{ie}	3.2	4.5	8.5	kΩ
	C	h_{ie}	6	8.7	15	kΩ
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 V, I_C = 0.01 mA	**Current Gain Group A**	h_{FE}	–	90	–	–
	B	h_{FE}	–	150	–	–
	C	h_{FE}	–	270	–	–
at V_{CE} = 5 V, I_C = 2 mA	**Current Gain Group A**	h_{FE}	–	170	–	–
	B	h_{FE}	–	290	–	–
	C	h_{FE}	–	500	–	–
at V_{CE} = 5 V, I_C = 100 mA	**Current Gain Group A**	h_{FE}	–	120[1]	–	–
	B	h_{FE}	–	200[1]	–	–
	C	h_{FE}	–	400[1]	–	–
Collector Saturation Voltage						
at I_C = 10 mA, I_B = 0.5 mA		V_{CEsat}	–	0.07	0.2	V
at I_C = 100 mA, I_B = 5 mA		V_{CEsat}	–	0.2	0.6[1]	V
Base Saturation Voltage						
at I_C = 10 mA, I_B = 0.5 mA		V_{BEsat}	–	0.73	0.83	V
at I_C = 100 mA, I_B = 5 mA		V_{BEsat}	–	0.87	1.05[1]	V
Base Emitter Voltage						
at V_{CE} = 5 V, I_C = 0.1 mA		V_{BE}	–	0.55	–	V
at V_{CE} = 5 V, I_C = 2 mA		V_{BE}	0.55	0.62	0.7	V
at V_{CE} = 5 V, I_C = 100 mA		V_{BE}	–	0.83[1]	–	V
Collector Cutoff Current						
at V_{CE} = 50 V	**BC107**	I_{CES}	–	0.2	15	nA
at V_{CE} = 30 V	**BC108, BC109**	I_{CES}	–	0.2	15	nA
at V_{CE} = 50 V, T_{amb} = 125 °C	**BC107**	I_{CES}	–	0.2	4	μA
at V_{CE} = 30 V, T_{amb} = 125 °C	**BC108, BC109**	I_{CES}	–	0.2	4	μA
Collector Emitter Breakdown Voltage						
at I_C = 2 mA	**BC107**	$V_{(BR)CEO}$	45	–	–	V
	BC108, BC109	$V_{(BR)CEO}$	25	–	–	V
Emitter Base Breakdown Voltage						
at I_E = 1 μA	**BC 107**	$V_{(BR)EBO}$	6	–	–	V
	BC108, BC109	$V_{(BR)EBO}$	5	–	–	V
Gain Bandwidth Product						
at V_{CE} = 3 V, I_C = 0.5 mA, f = 100 MHz		f_T	–	85	–	MHz
at V_{CE} = 5 V, I_C = 10 mA, f = 100 MHz		f_T	150	250	–	MHz
Collector Base Capacitance at V_{CBO} = 10 V, f = 1 MHz		C_{CBO}	–	3.5	6	pF
Emitter Base Capacitance at V_{EBO} = 0.5 V, f = 1 MHz		C_{EBO}	–	8	–	pF

Characteristics, continuation

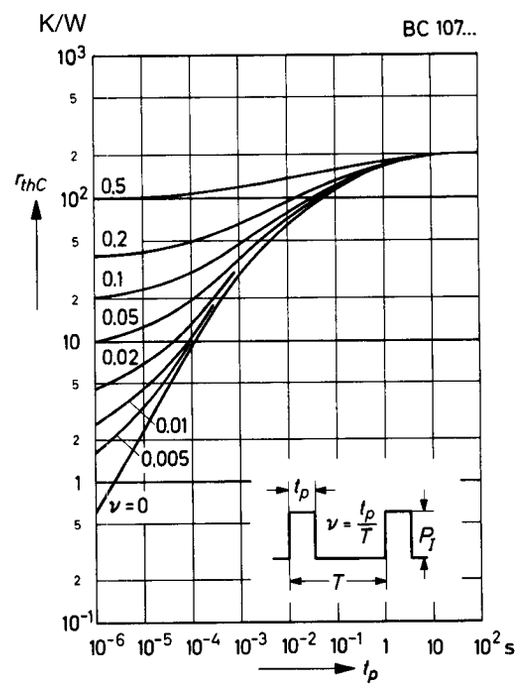
	Symbol	Min.	Typ.	Max.	Unit
Noise Figure at V_{CE} = 5 V, I_C = 0.2 mA, R_G = 2 kΩ, f = 1 kHz					
BC107, BC108	F	–	2	10	dB
BC109	F	–	–	4	dB
at V_{CE} = 5 V, I_C = 0.2 mA, R_G = 2 kΩ, f = 30 Hz . . . 15 kHz					
BC109	F	–	–	4	dB
Thermal Resistance					
Junction to Case	R_{thC}	–	–	200	K/W
Junction to Ambient	R_{thA}	–	–	500	K/W

[1] Not valid for BC109

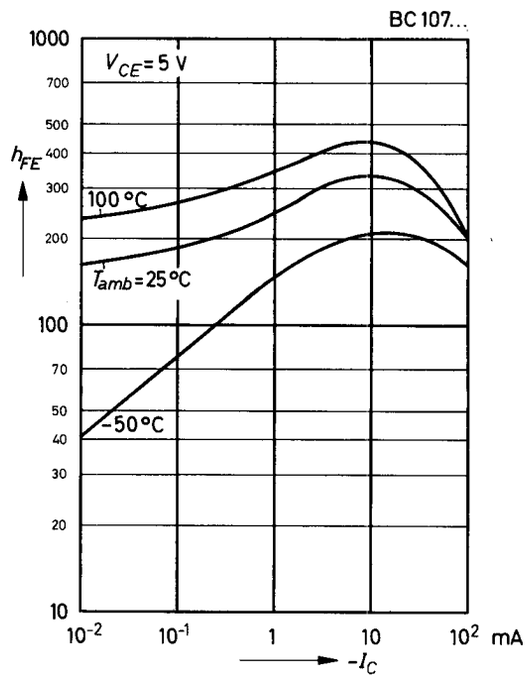
Admissible power dissipation versus temperature



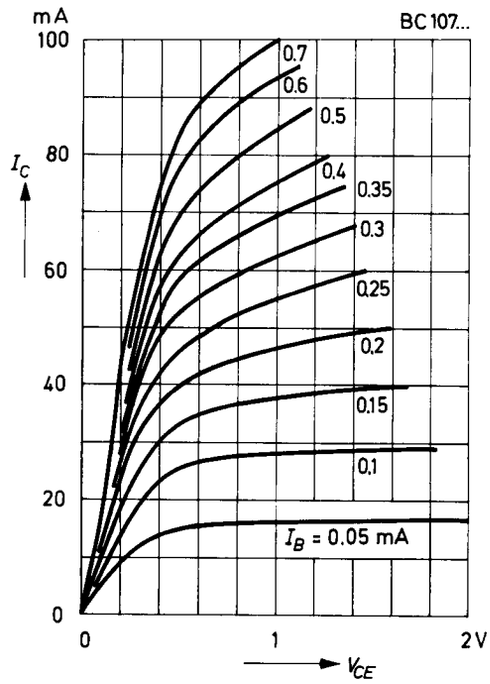
Pulse thermal resistance versus pulse duration



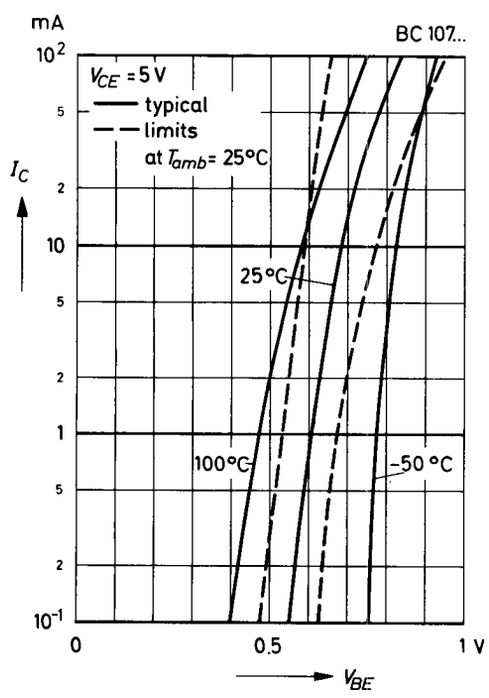
DC current gain versus collector current



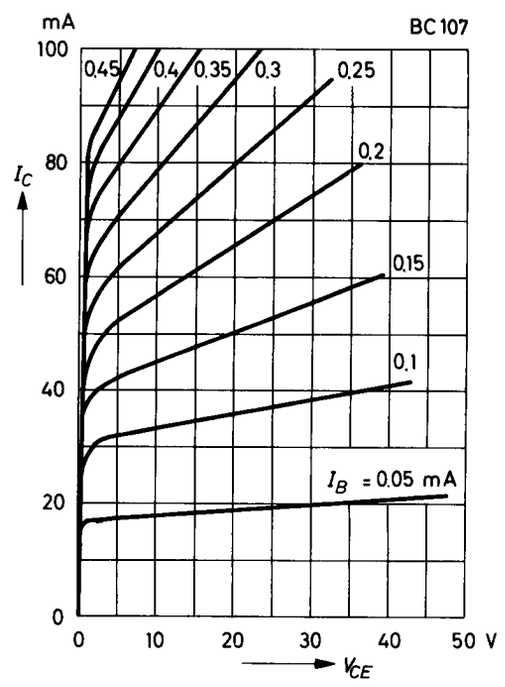
Common emitter collector characteristics



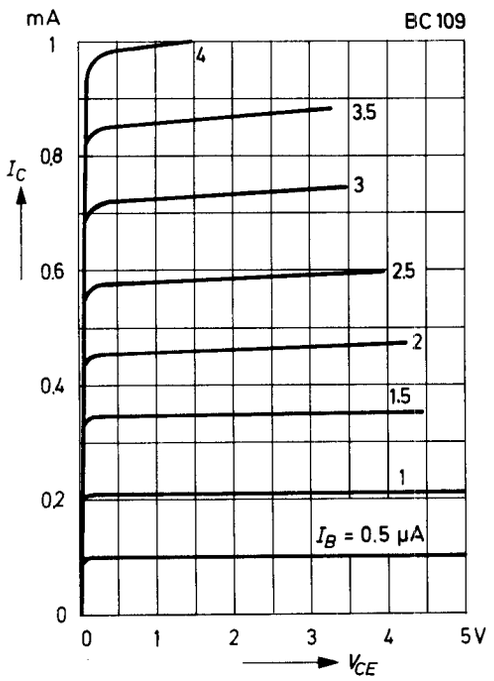
Collector current versus base emitter voltage



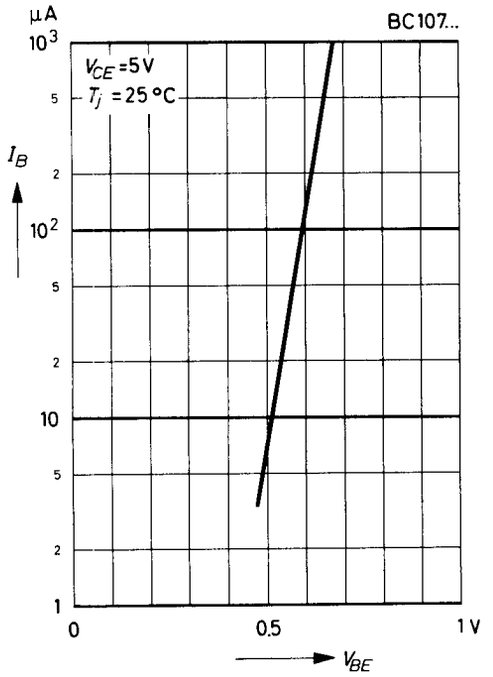
Common emitter collector characteristics



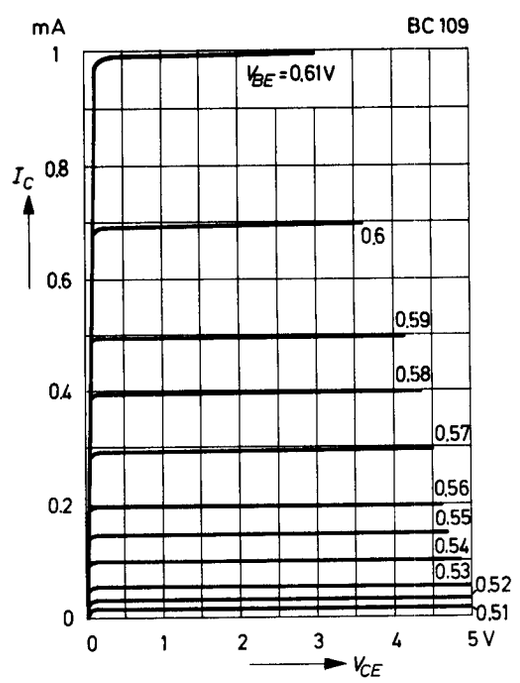
Common emitter collector characteristics



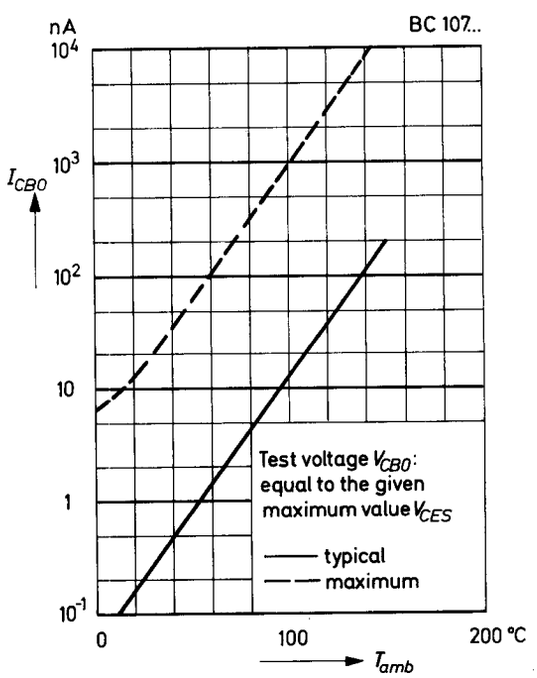
Common emitter input characteristic



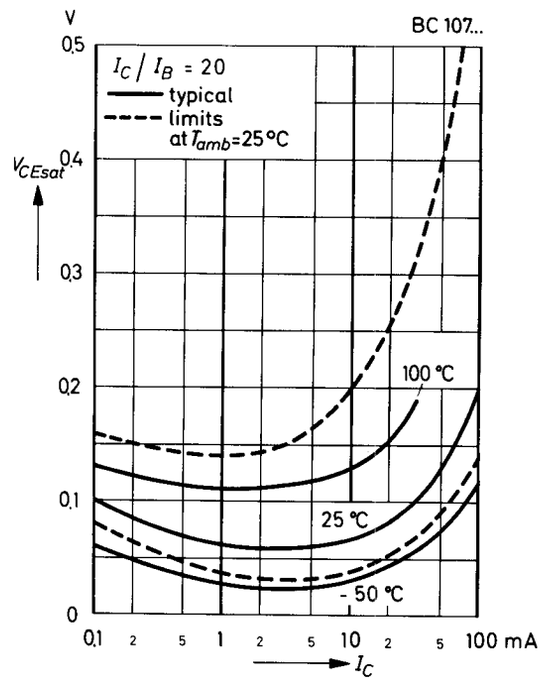
Common emitter collector characteristics



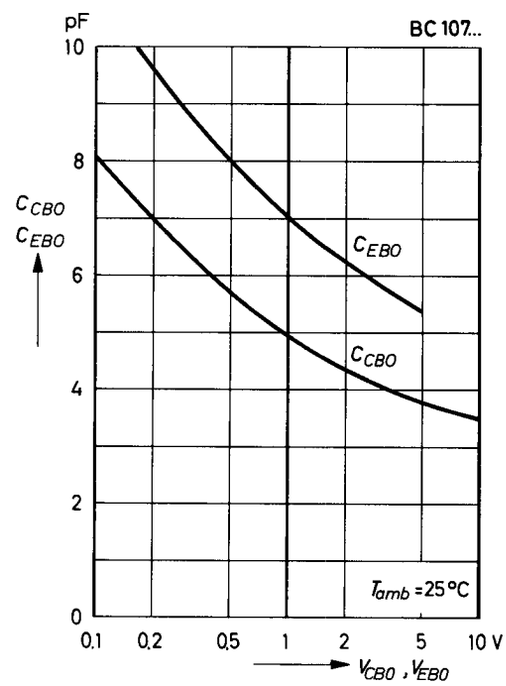
Collector cutoff current versus ambient temperature



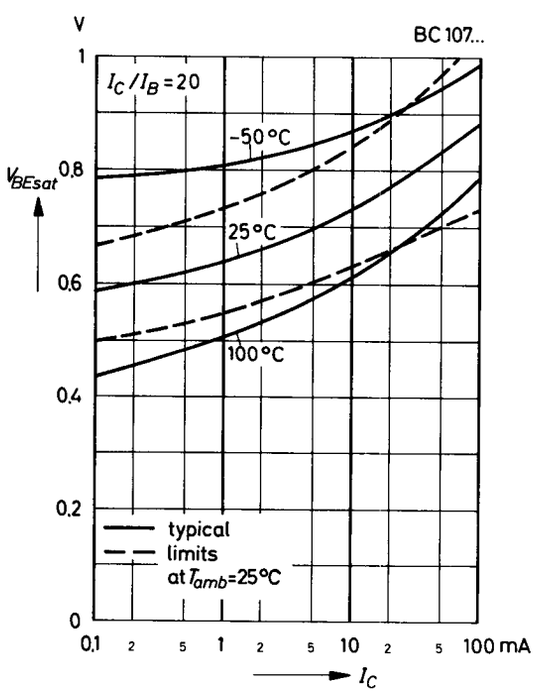
Collector saturation voltage versus collector current



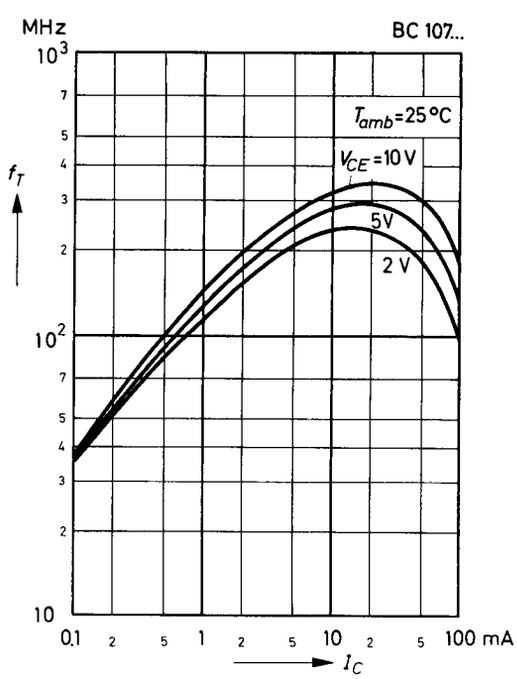
Collector base capacitance, Emitter base capacitance versus reverse bias voltage



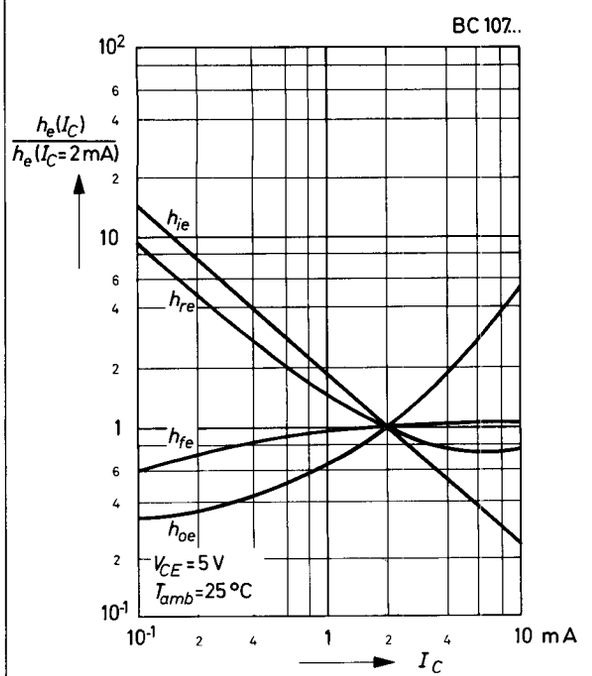
Base saturation voltage versus collector current



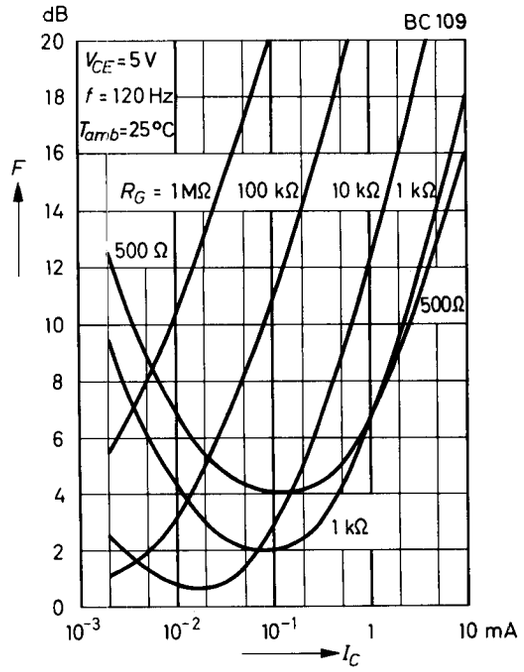
Gain bandwidth product versus collector current



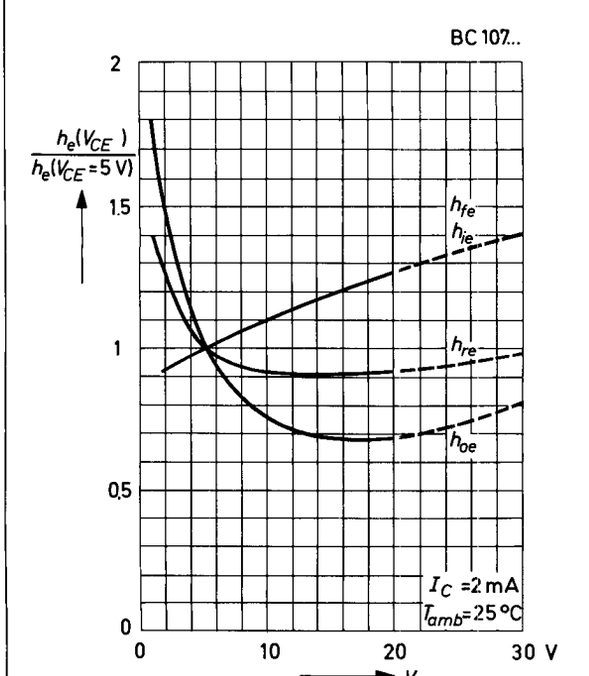
Relative h-parameters versus collector current



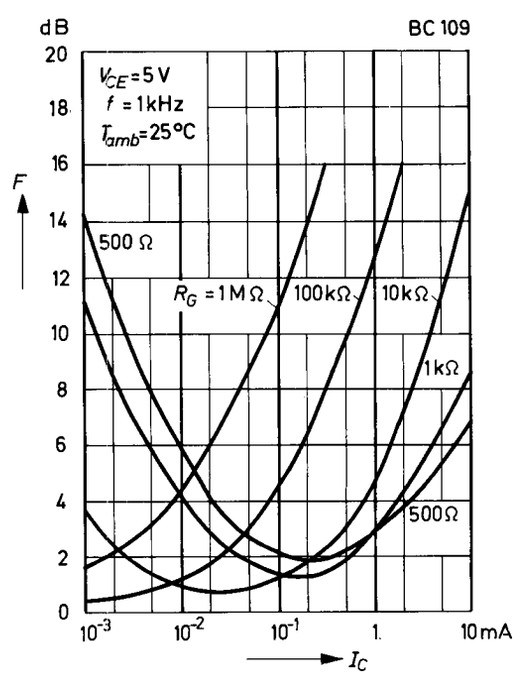
Noise figure versus collector current



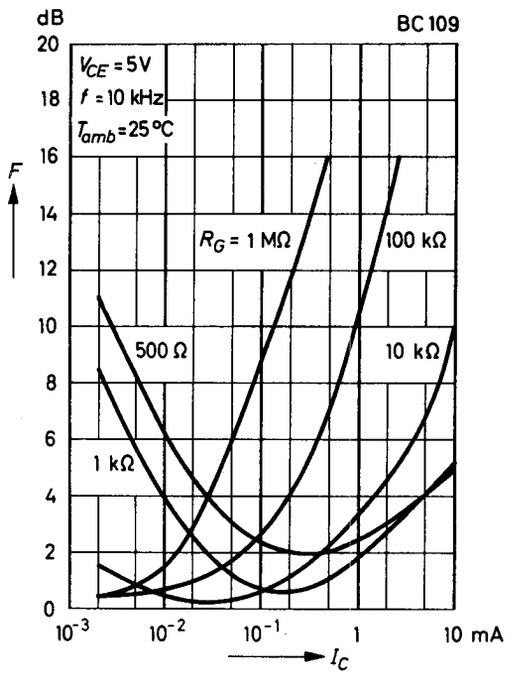
Relative h-parameters versus collector emitter voltage



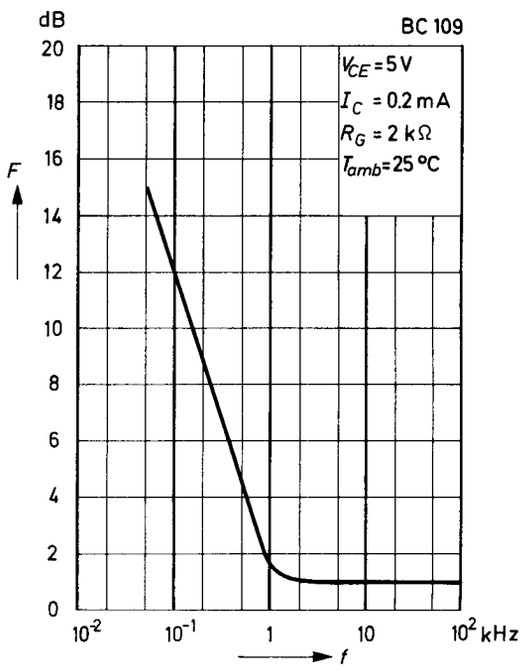
Noise figure versus collector current



Noise figure versus collector current



Noise figure versus frequency



Noise figure versus collector emitter voltage