SILICON PLANAR NPN

BC 207
BC 208
BC 209

GENERAL PURPOSE AUDIO AMPLIFIERS

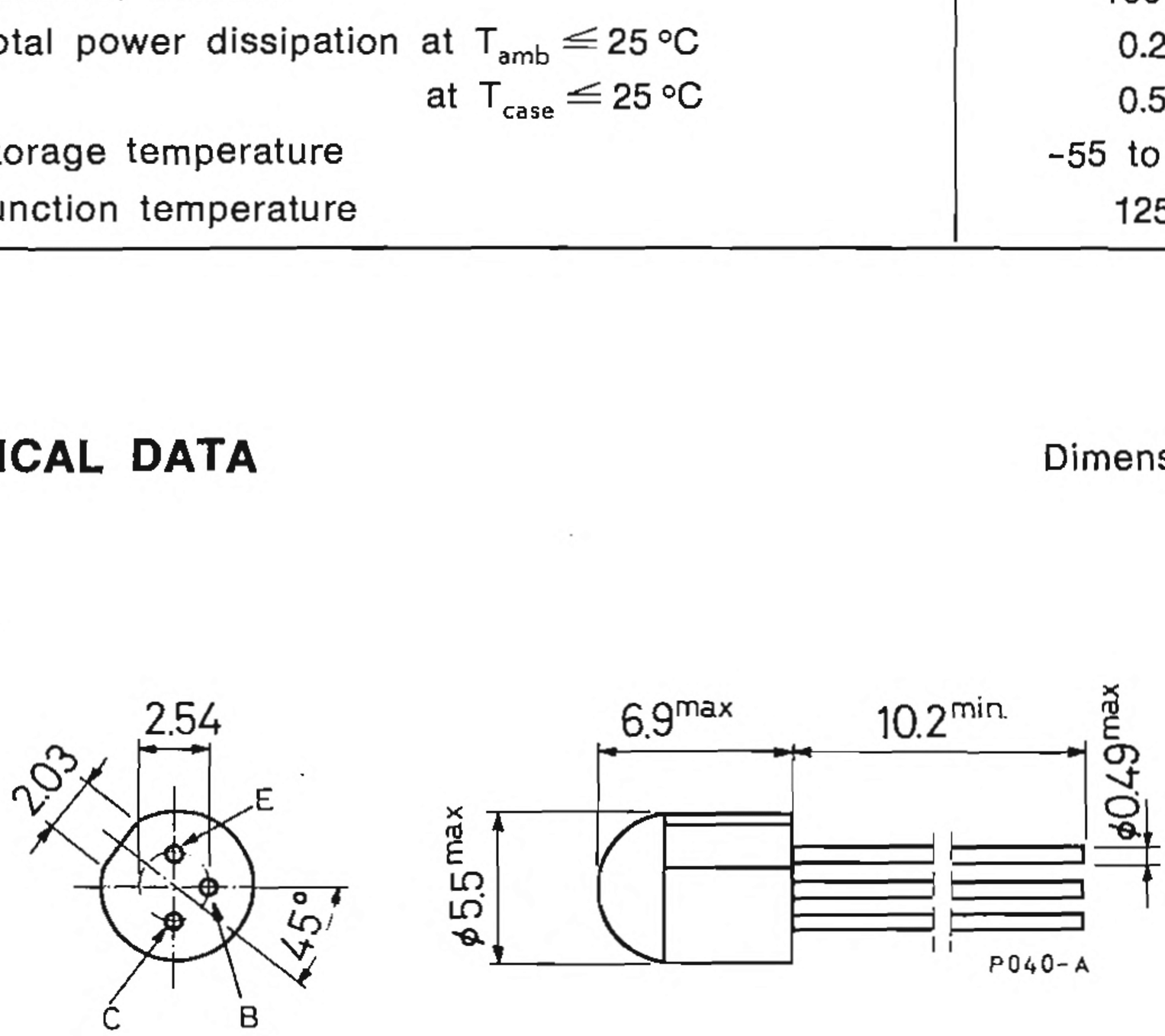
The BC 207, BC 208 and BC 209 are silicon planar epitaxial NPN transistors in TO-18 epoxy package. They are intended for use in driver or input stages of audio amplifier and in signal processing circuits of TV receivers.

ABSOLUTE MAXIMUM RATINGS

		BC 207	BC 208 BC 209
V_{CBO}	Collector-base voltage ($I_E = 0$)	50 V	25 V
V_{CEO}	Collector-emitter voltage ($I_B = 0$)	45 V	20 V
V_{EBO}	Emitter-base voltage ($I_C = 0$)	5 V	
I_C	Collector current	100 mA	
P_{tot}	Total power dissipation at $T_{amb} \leq 25$ °C	0.2 W	
	at $T_{case} \leq 25$ °C	0.5 W	
T_{stg}	Storage temperature	-55 to 125 °C	
T_j	Junction temperature	125 °C	

MECHANICAL DATA

Dimensions in mm



TO-18 epoxy

BC 207
BC 208
BC 209

THERMAL DATA

$R_{th\ j\text{-}case}$	Thermal resistance junction-case	max	200	°C/W
$R_{th\ j\text{-}amb}$	Thermal resistance junction-ambient	max	500	°C/W

ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C unless otherwise specified)

Parameter		Test conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector cutoff current (I_E = 0)	V_{CB} = 40 V V_{CB} = 40 V T_{amb} = 65 °C			50 50	nA µA
$V_{(BR)\ CBO}$	Collector-base breakdown voltage (I_E = 0)	I_C = 10 µA for **BC 207** for **BC 208-BC 209**	50 25			V V
$V_{(BR)\ CEO}$	Collector-emitter breakdown voltage (I_B = 0)	I_C = 10 mA for **BC 207** for **BC 208-BC 209**	45 20			V V
$V_{(BR)\ EBO}$	Emitter-base breakdown voltage (I_C = 0)	I_E = 10 µA	5			V
$V_{CE\ (sat)}$*	Collector-emitter saturation voltage	I_C = 10 mA I_B = 0.5 mA I_C = 100 mA I_B = 5 mA			0.25 0.6	V V
h_{FE}	DC current gain	I_C = 2 mA V_{CE} = 5 V for **BC 207** for **BC 207** Gr. A for **BC 207** Gr. B for **BC 208** for **BC 208** Gr. A for **BC 208** Gr. B for **BC 208** Gr. C for **BC 209** for **BC 209** Gr. B for **BC 209** Gr. C	 110 110 200 110 110 200 420 200 200 420	 230 180 290 350 180 290 520 350 290 520	 450 220 450 800 220 450 800 800 450 800	 — — — — — — — — — —

* Pulsed: pulse duration = 300 µs, duty factor = 1%.

ELECTRICAL CHARACTERISTICS (continued)

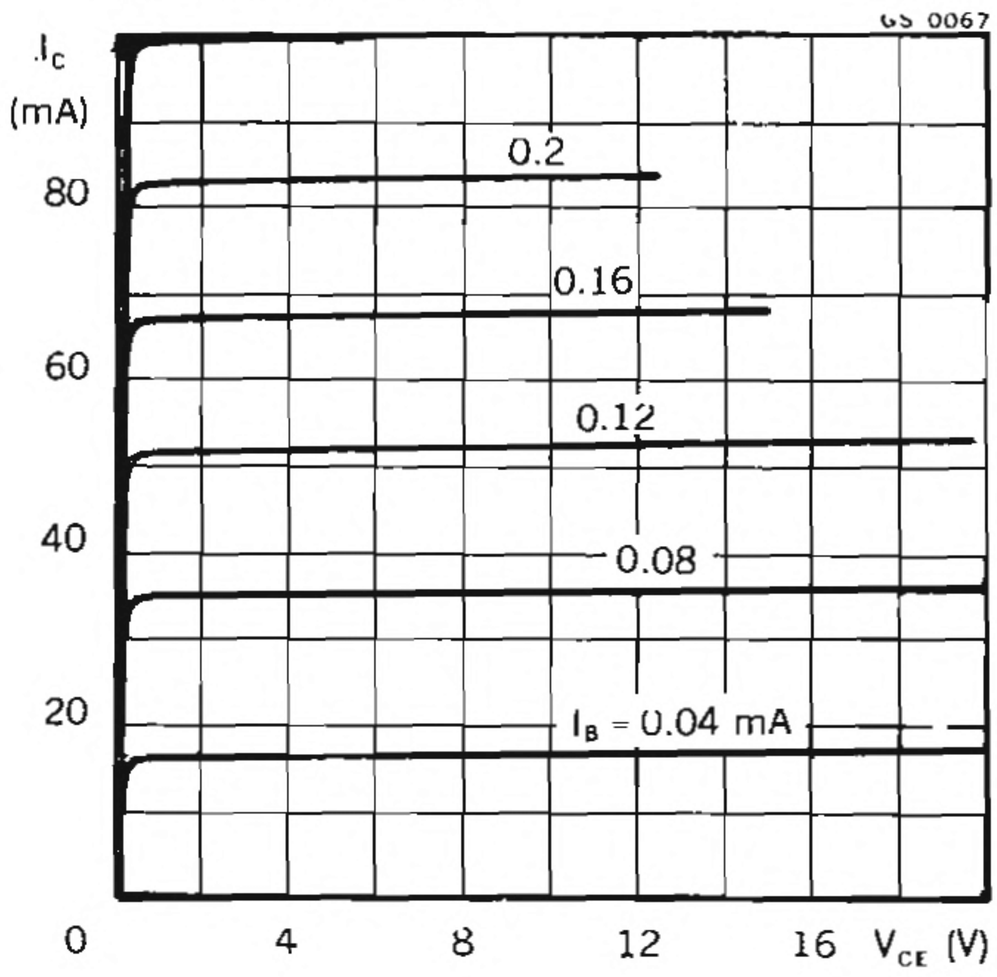
Parameter		Test conditions	Min.	Typ.	Max.	Unit
h_{FE}	DC current gain	I_C = 10 μA V_{CE} = 5 V				
		for **BC 207**		120		—
		for **BC 207** Gr. A		90		—
		for **BC 207** Gr. B	40	150		—
		for **BC 208**		120		—
		for **BC 208** Gr. A		90		—
		for **BC 208** Gr. B	40	150		—
		for **BC 208** Gr. C	100	270		—
		for **BC 209**	70	210		—
		for **BC 209** Gr. B	40	150		—
		for **BC 209** Gr. C	100	270		—
f_T	Transition frequency	V_{CE} = 5 V I_C = 10 mA		200		MHz
NF	Noise figure	I_C = 0.2 mA V_{CE} = 5 V				
		R_g = 2 kΩ f = 1 kHz				
		B = 200 Hz				
		for **BC 207**	2		10	dB
		for **BC 208**	2		10	dB
		for **BC 209**	1.5		4	dB
C_{CBO}	Collector-base capacitance	I_E = 0 V_{CB} = 10 V				
		f = 1 MHz		3.1	6	pF
h_{ie}	Input impedance	I_C = 2 mA V_{CE} = 5 V				
		f = 1 kHz				
		for **BC 207**		4		kΩ
		for **C 207** Gr. A		3		kΩ
		for **BC 207** Gr. B		4.8		kΩ
		for **BC 208**		5.5		kΩ
		for **BC 208** Gr. A		3		kΩ
		for **BC 208** Gr. B		4.8		kΩ
		for **BC 208** Gr. C		7		kΩ
		for **BC 209**		5.5		kΩ
		for **BC 209** Gr. B		4.8		kΩ
		for **BC 209** Gr. C		7		kΩ
h_{oe}	Output admittance	I_C = 2 mA V_{CE} = 5 V				
		f = 1 kHz				
		for **BC 207**		20		μS
		for **BC 207** Gr. A		13		μS
		for **BC 207** Gr. B		26		μS

BC 207
BC 208
BC 209

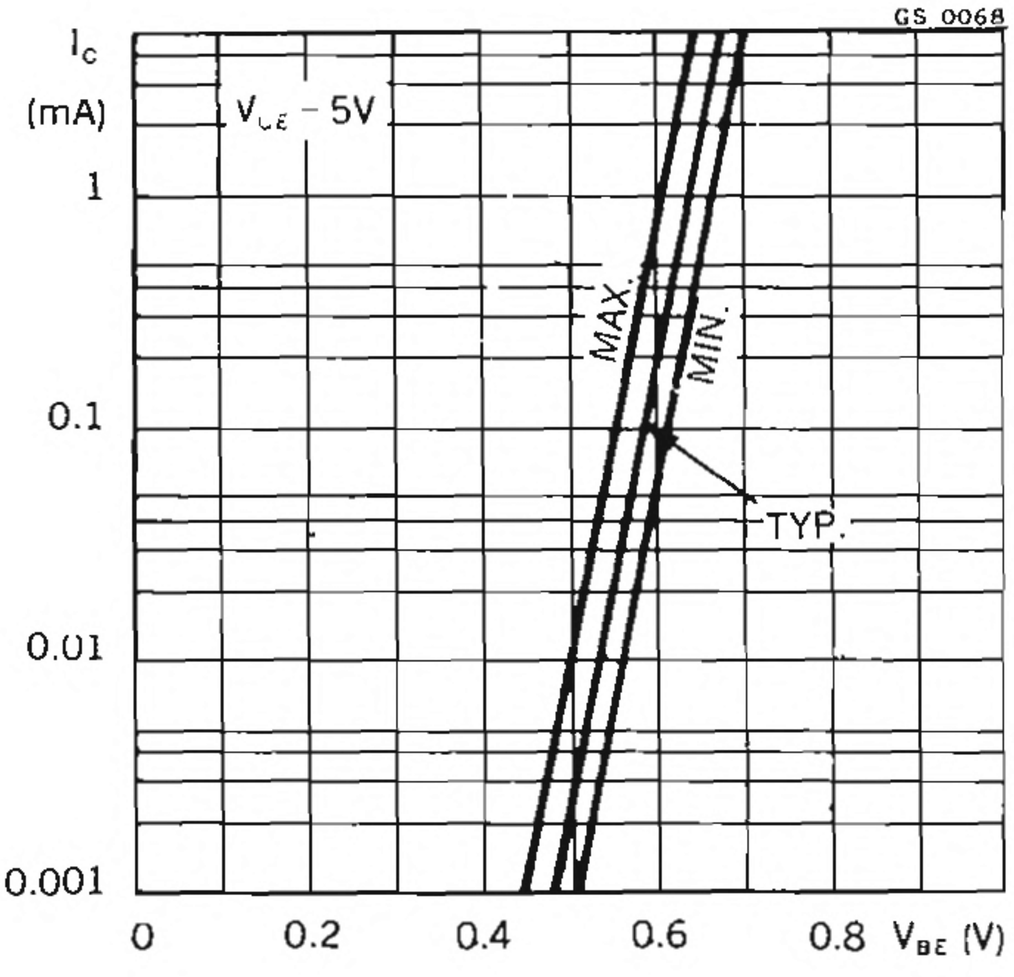
ELECTRICAL CHARACTERISTICS (continued)

h_{oe} Output admittance	for **BC 208**	30	µS
	for **BC 208** Gr. A	13	µS
	for **BC 208** Gr. B	26	µS
	for **BC 208** Gr. C	34	µS
	for **BC 209**	30	µS
	for **BC 209** Gr. B	26	µS
	for **BC 209** Gr. C	34	µS
h_{re} Reverse voltage ratio	I_C = 2 mA V_{CE} = 5 V f = 1 kHz		
	for **BC 207**	$2.7x10^{-4}$	—
	for **BC 207** Gr. A	$1.7x10^{-4}$	—
	for **BC 207** G . B	$3.7x10^{-4}$	—
	for **BC 208**	$3.1x10^{-4}$	—
	for **BC 208** Gr. A	$1.7x10^{-4}$	—
	for **BC 208** Gr. B	$2.7x10^{-4}$	—
	for **BC 208** Gr. C	$3.8x10^{-4}$	—
	for **BC 209**	$3.1x10^{-4}$	—
	for **BC 209** Gr. B	$2.7x10^{-4}$	—
	for **BC 209** Gr. C	$3.8x10^{-4}$	—

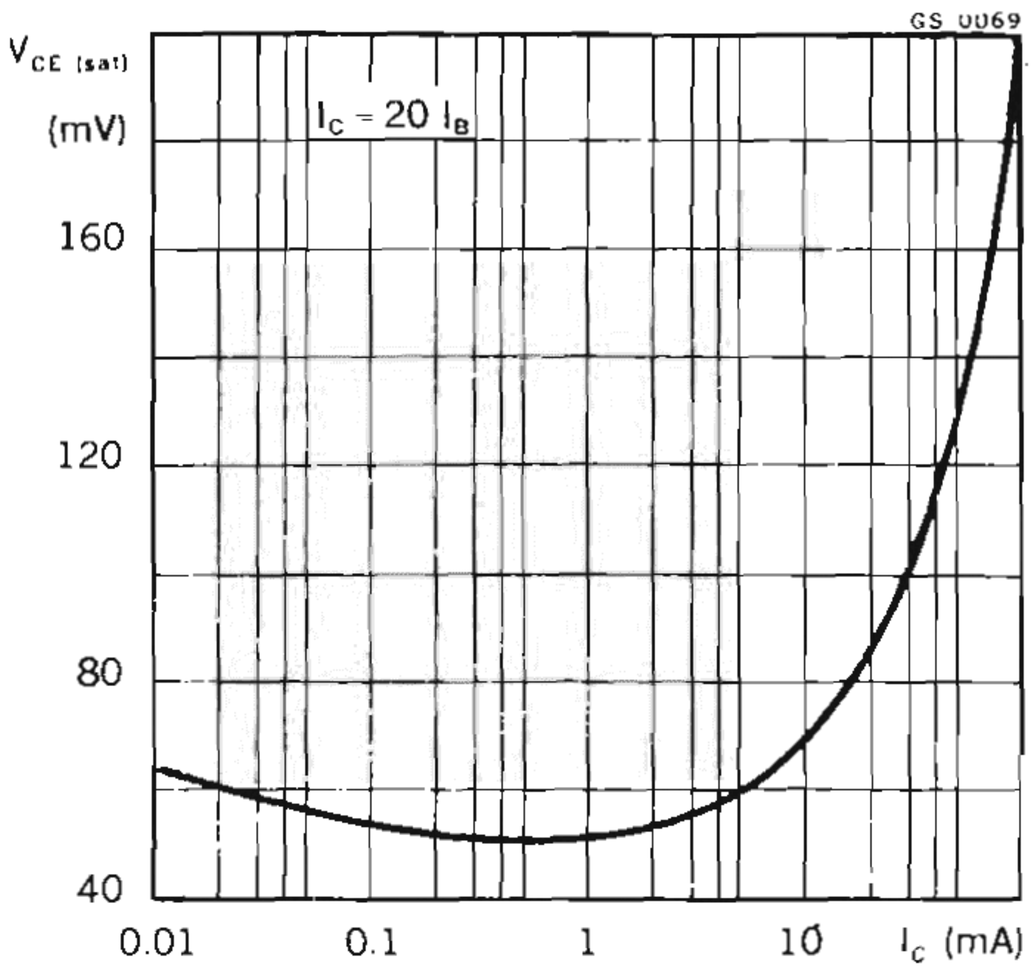
Typical output characteristics
(for **BC 209** only)



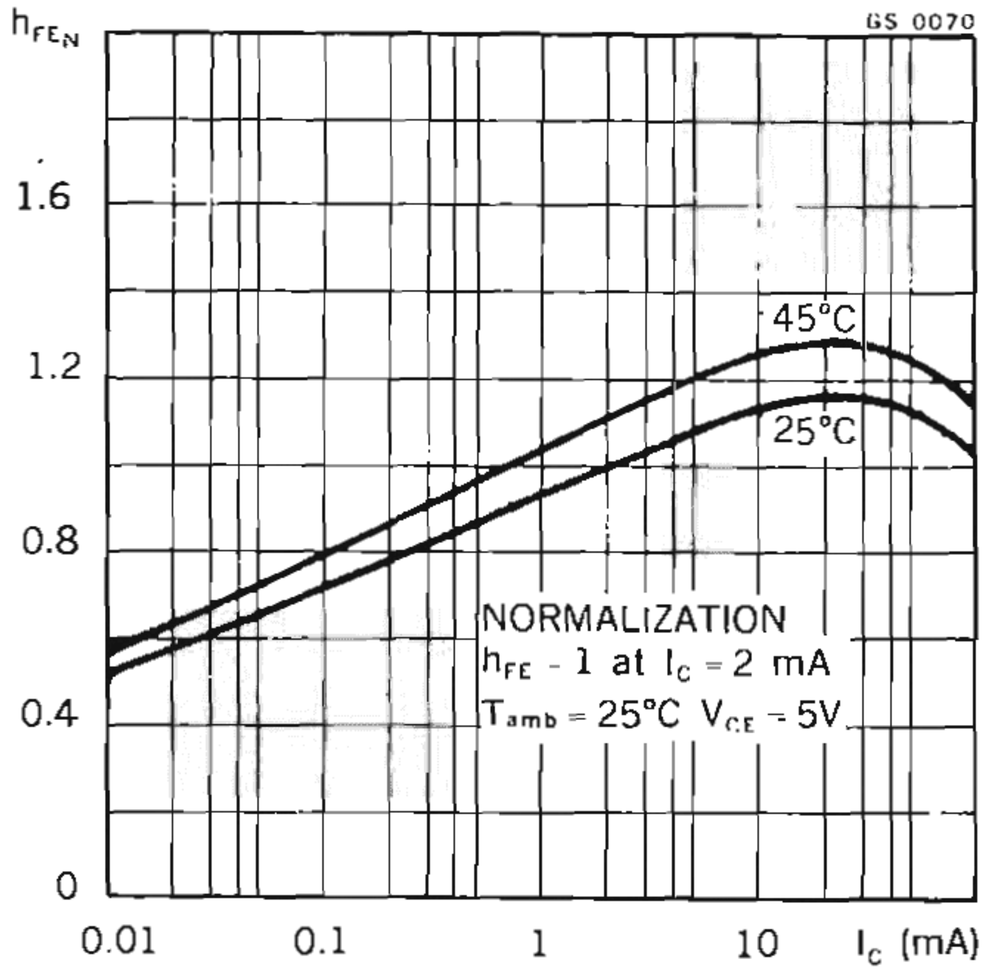
DC transconductance



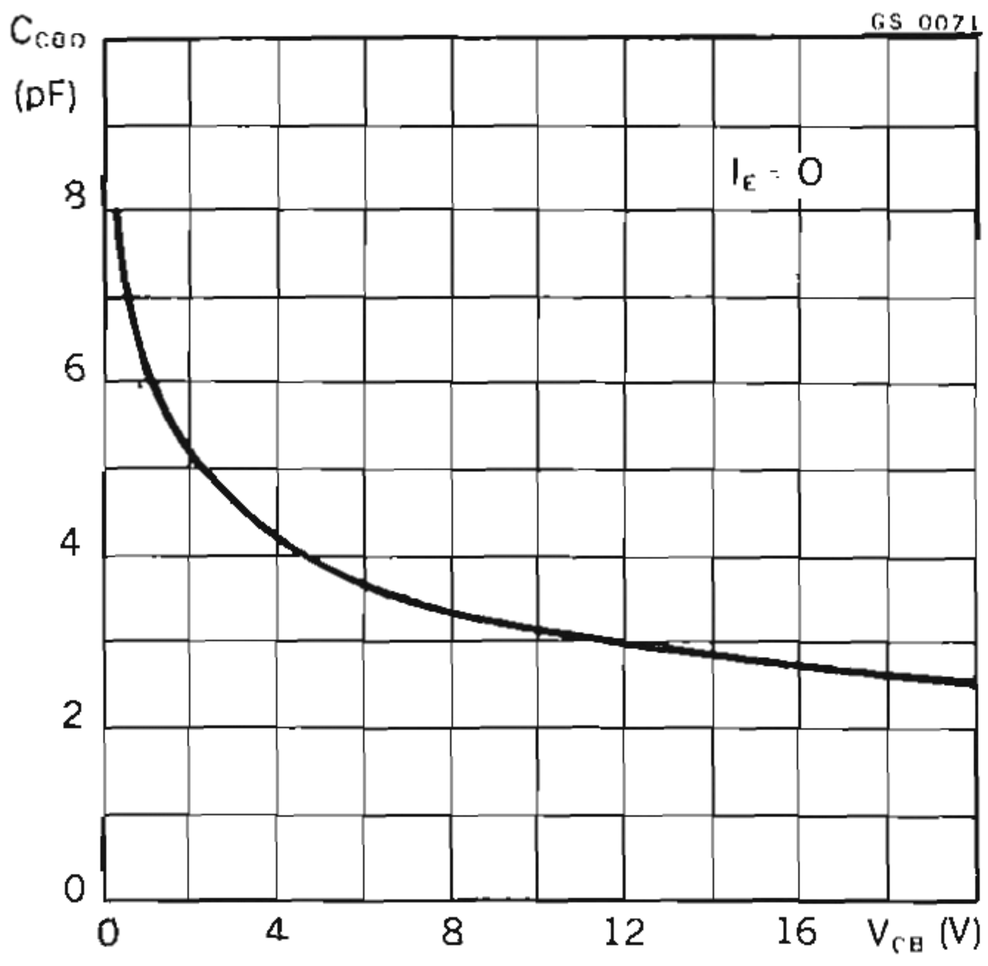
Typical collector-emitter saturation voltage



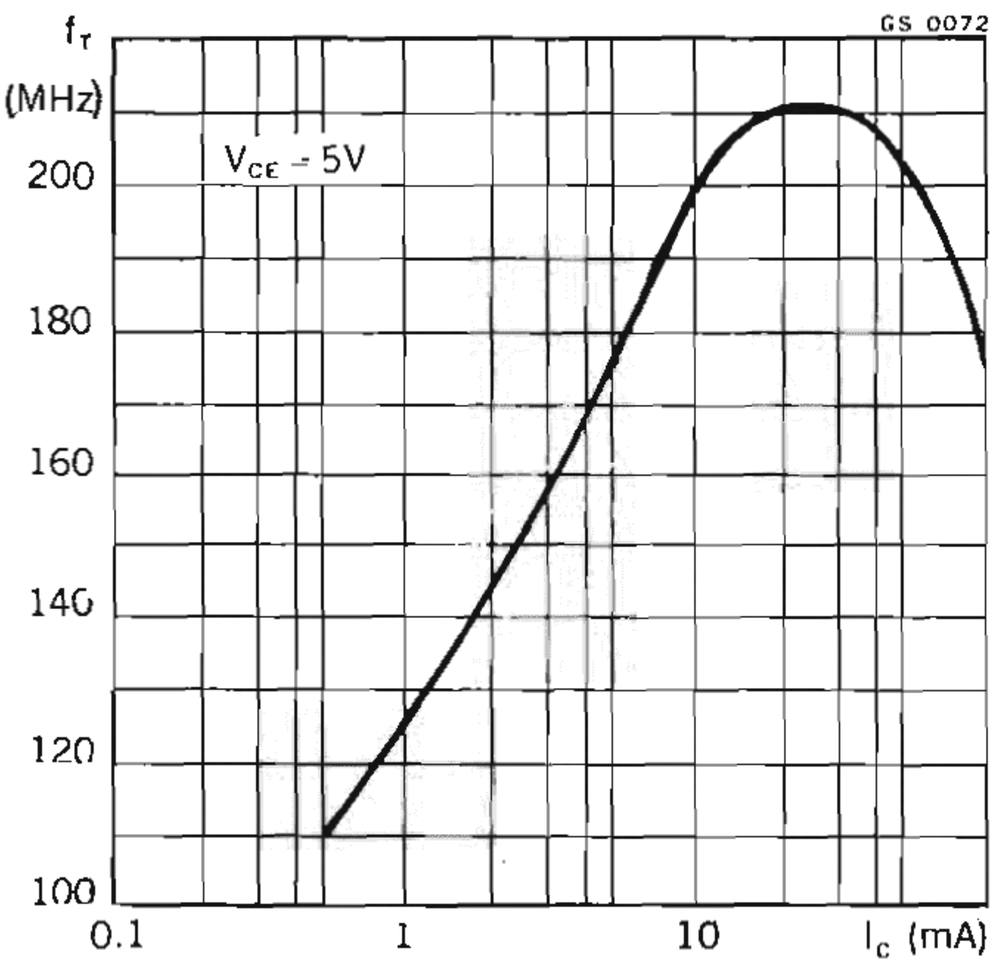
DC normalized current gain



Typical collector-base capacitance

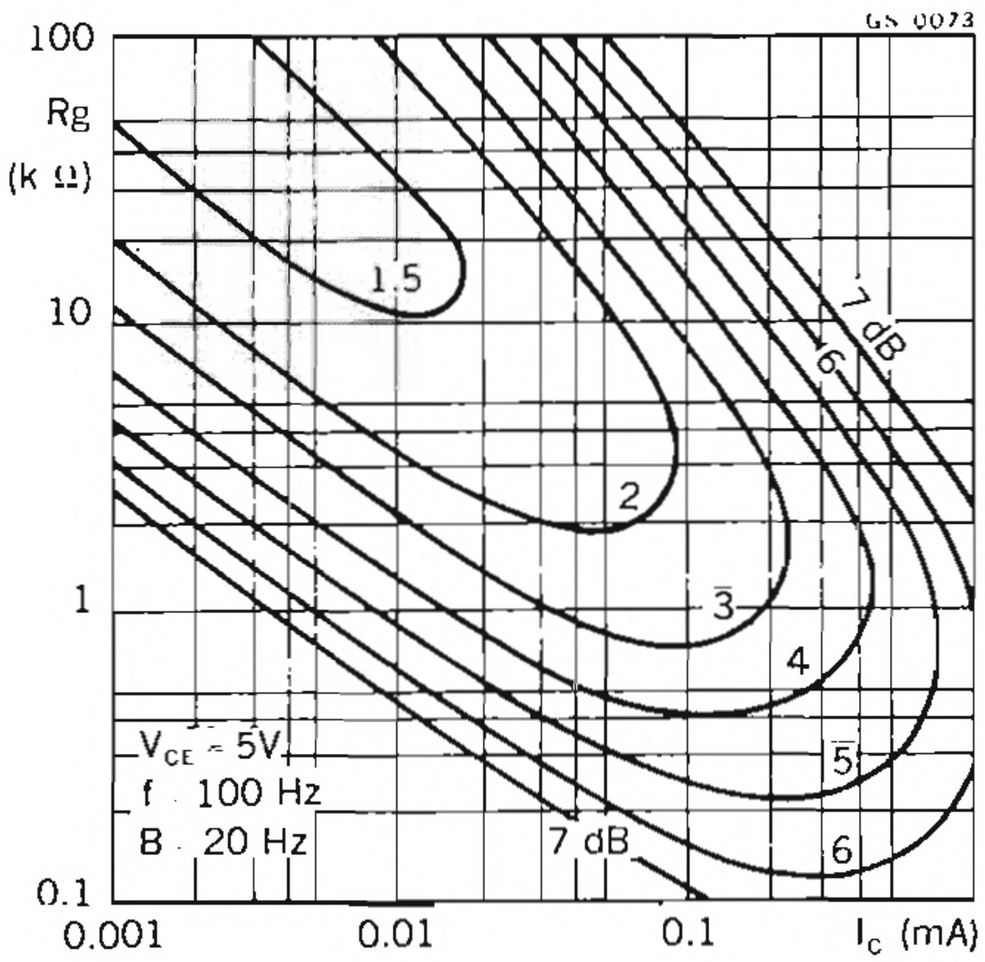


Typical transition frequency

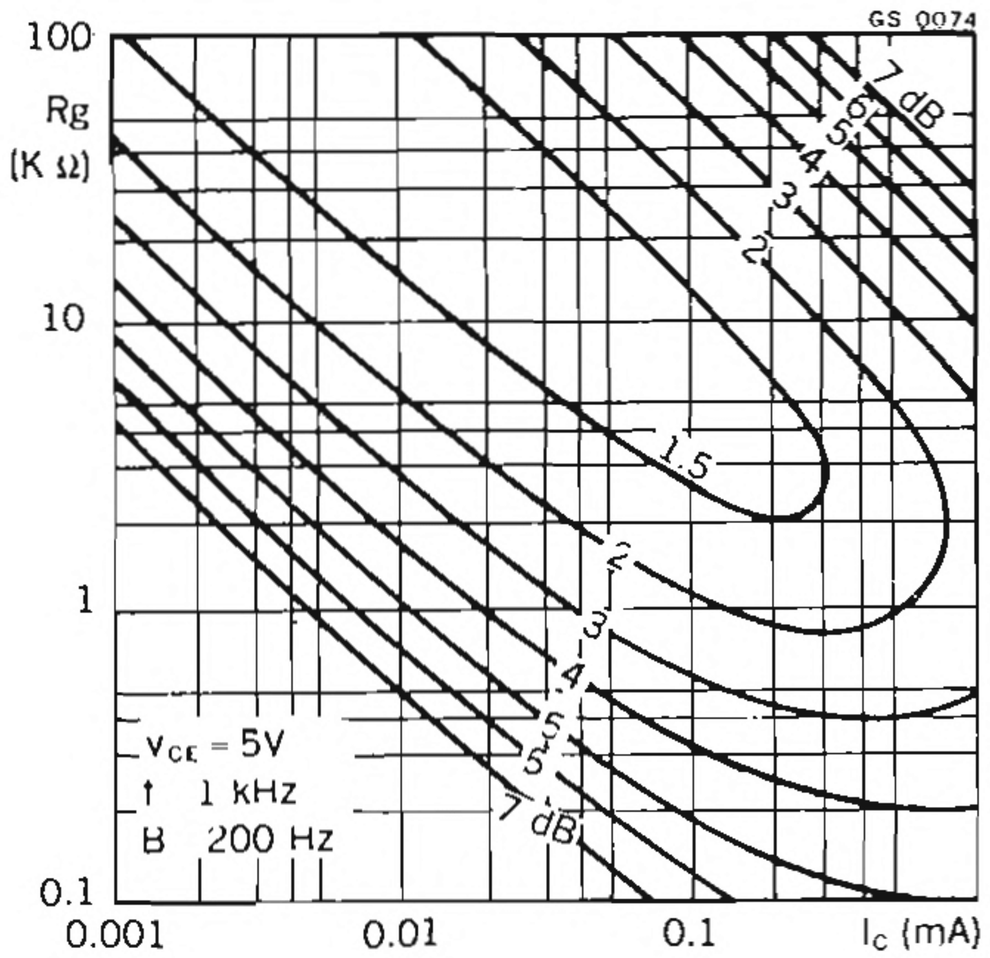


BC 207
BC 208
BC 209

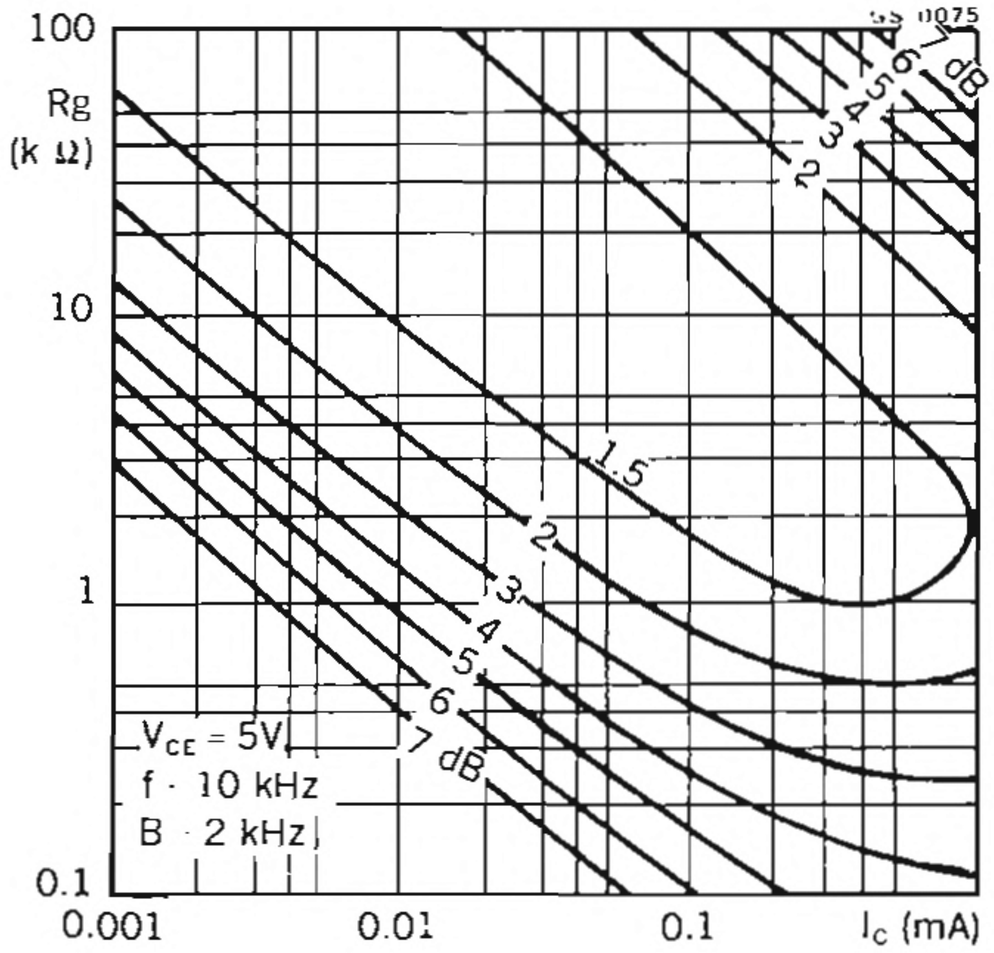
Typical noise figure (for **BC 209** only)



Typical noise figure (for **BC 209** only)



Typical noise figure (for **BC 209** only)



Typical noise figure (for **BC 209** only)