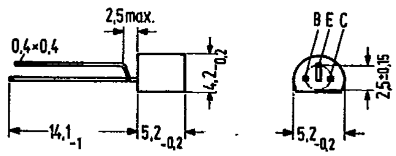
for gain-controlled TV IF amplifier stages

BF 198 is an NPN silicon planar radio-frequency transistor in TO 92 plastic package (10 A 3 DIN 41868). The transistor is characterized by a low reverse transfer capacitance and is recommended for use in gain-controlled IF amplifier stages of TV sets in common-emitter configuration.

Type	Ordering code
BF 198	Q62702-F354



Approx. weight 0.25 g Dimensions in mm

Maximum ratings

Collector-emitter-voltage	V_{CEO}	30	V
Collector-base voltage	V_{CBO}	40	V
Base-emitter voltage	V_{EBO}	4	V
Collector current	I_C	25	mA
Base current	I_B	3	mA
Junction temperature	T_j	150	°C
Storage temperature range	T_{stg}	–55 to +150	°C
Total power dissipation (T_{amb} ≤ 25 °C)	P_{tot}	500	mW

Thermal resistance

Junction to ambient air	R_{thJA}	≤250	K/W

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

Collector cutoff current (V_{CB} = 40 V)	I_{CBO}	< 100	nA
DC current gain (V_{CE} = 10 V; I_C = 4 mA)	h_{FE}	70 (> 26)	–
(V_{CE} = 3 V; I_C = 10 mA)	h_{FE}	> 10	–
Base-emitter voltage (V_{CE} = 10 V; I_C = 4 mA)	V_{BE}	750	mV

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

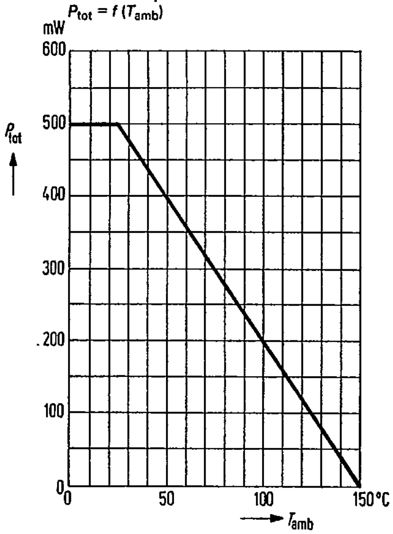
Transition frequency (V_{CE} = 10 V; I_C = 4 mA; f = 100 MHz)	f_T	400	MHz
Reverse transfer capacitance (V_{CE} = 10 V; I_C = 1 mA; f = 1 MHz)	$-C_{12e}$	0.22	pF
Noise figure (V_{CE} = 10 V; I_C = 4 mA; f = 35 MHz; R_g = 100 Ω)	NF	3	dB
Obtainable power gain (V_{CE} = 10 V; I_C = 4 mA; f = 35 MHz)	G_{peopt}[1]	42	dB

Four-pole characteristics: (V_{CE} = 10 V; I_C = 4 mA; f = 35 MHz)

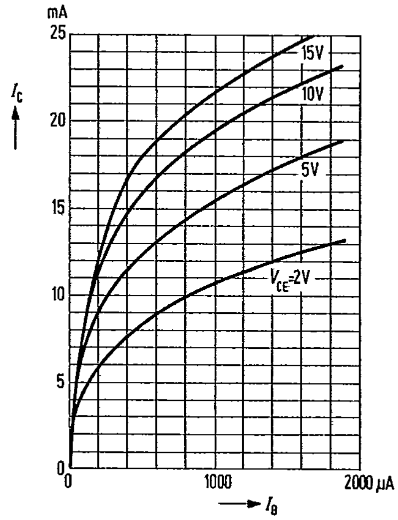
g_{11e} = 4,5 mS	$\|y_{12e}\|$ = 47 µS	$\|y_{21e}\|$ = 105 mS	g_{22e} = 40 µS
c_{11e} = 40 pF	$-\varphi_{12e}$ = 95°	$-\varphi_{21e}$ = 20°	c_{22e} = 1,3 pF

1) $G_{peopt} = \frac{|y_{21e}|^2}{4 g_{11e} \cdot g_{22e}}$

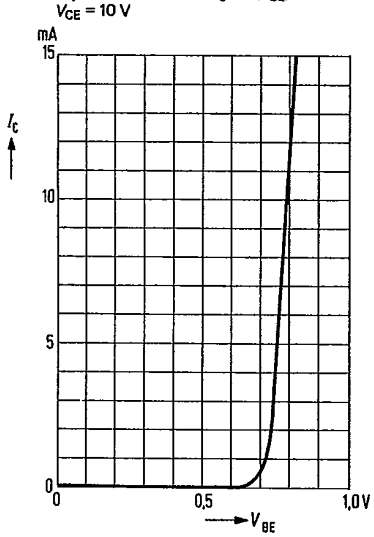
Total perm. power dissipation versus temperature
$P_{tot} = f(T_{amb})$



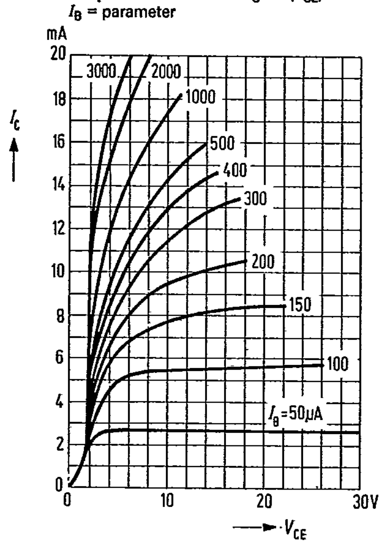
Collector current $I_C = f(I_B)$



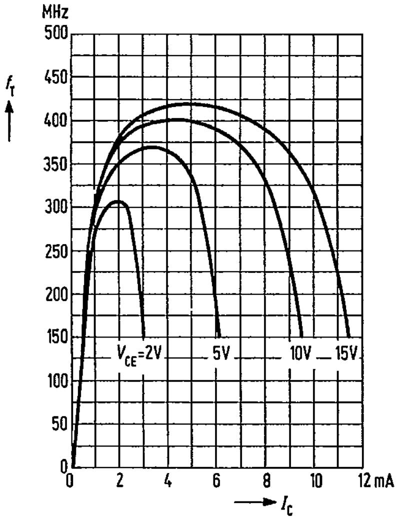
Input characteristic $I_C = f(V_{BE})$
$V_{CE} = 10\ V$



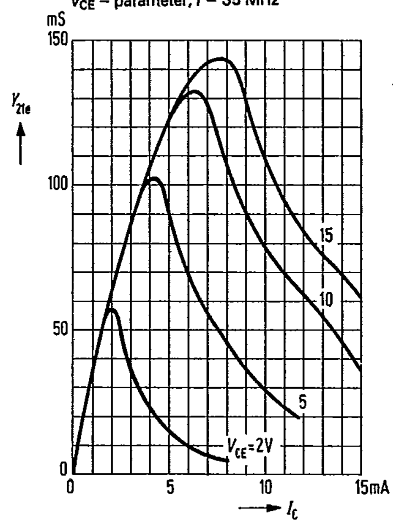
Output characteristics $I_C = f(V_{CE})$
I_B = parameter



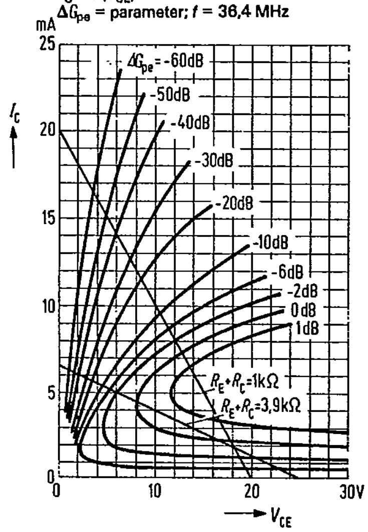
Transition frequency $f_T = f(I_C)$
V_{CE} = parameter



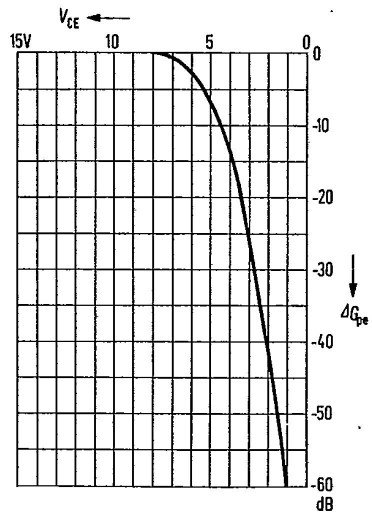
Short-circuit forward transfer admittance $y_{21e} = f(I_C)$
V_{CE} = parameter; f = 35 MHz



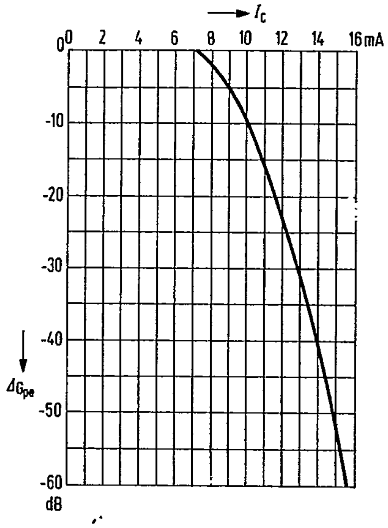
Constant power gain characteristics
$I_C = f(V_{CE})$
ΔG_{pe} = parameter; f = 36,4 MHz



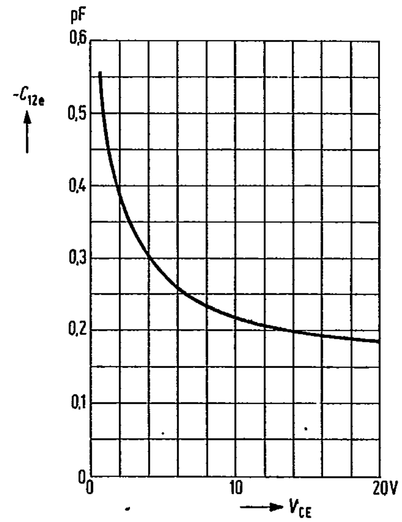
Power gain control range
$\Delta G_{pe} = f(V_{CE})$; $R_E + R_C$ = 3.9 kΩ;
f = 36.4 MHz; $-V_{EE}$ = 25 V



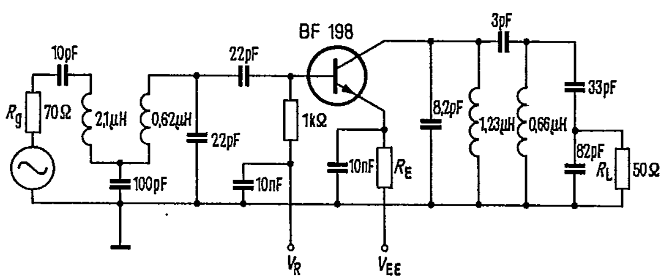
Control range of power gain
$\Delta G_{pe} = f(I_C)$; $R_E + R_C = 1\,k\Omega$;
$-V_{EE} = 20\,V$; $f = 36.4\,MHz$



Reverse transfer capacitance
$C_{12e} = f(V_{CE})$; $I_C = 1\,mA$; $f = 1\,MHz$



First stage of a TV IF amplifier incl. voltage gain control $f = 36.4$ MHz.



Power gain ($I_C = 4$ mA; $-V_{EE} = 25$ V; $R_E + R_C = 3.9\,k\Omega$)	G_p	26	dB
Gain control range	ΔG_p	60	dB