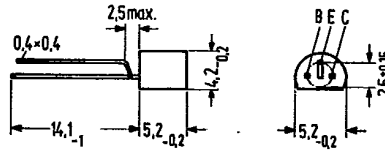


for gain-controlled TV IF amplifier stages

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_{CE0}	30	V
Collector-base voltage	V_{CB0}	40	V
Base-emitter voltage	V_{EB0}	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 ($T_{amb} \leq 25^\circ\text{C}$)	P_{tot}	500	mW

Thermal resistance

Junction to ambient air	R_{thJA}	≤ 250	K/W
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Static characteristics ($T_{amb} = 25^{\circ}\text{C}$)

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

Dynamic characteristics ($T_{amb} = 25^{\circ}\text{C}$)

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

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

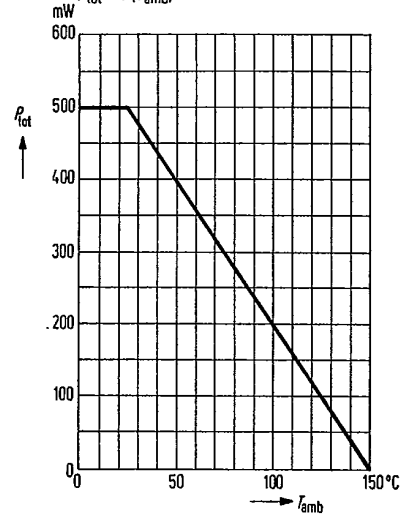
$g_{11e} = 4,5\text{ mS}$	$[y_{12e}] = 47\ \mu\text{S}$	$[y_{21e}] = 105\text{ mS}$	$g_{22e} = 40\ \mu\text{S}$
$c_{11e} = 40\text{ pF}$	$-\varphi_{12e} = 95^{\circ}$	$-\varphi_{21e} = 20^{\circ}$	$c_{22e} = 1,3\text{ pF}$

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

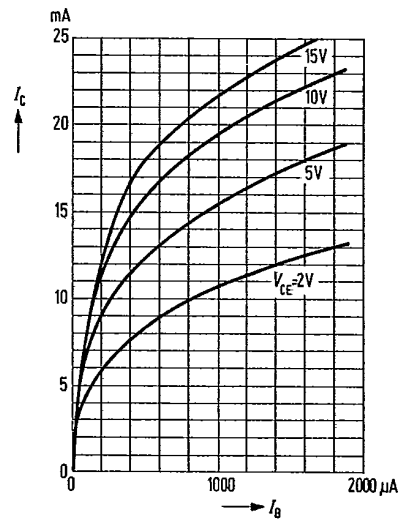
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Total perm. power dissipation versus temperature

$P_{tot} = f(T_{amb})$

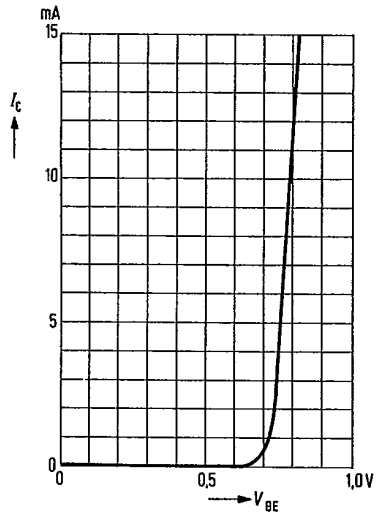


Collector current $I_C = f(I_B)$



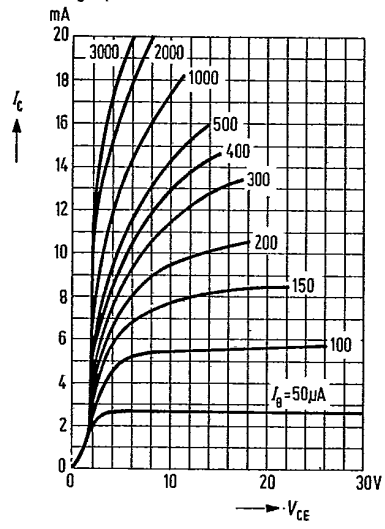
Input characteristic $I_C = f(V_{BE})$

$V_{CE} = 10 V$



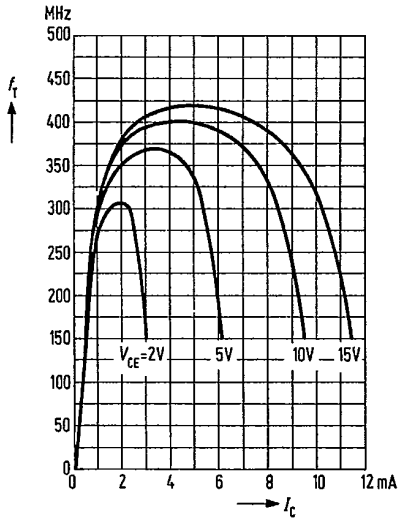
Output characteristics $I_C = f(V_{CE})$

$I_B = \text{parameter}$

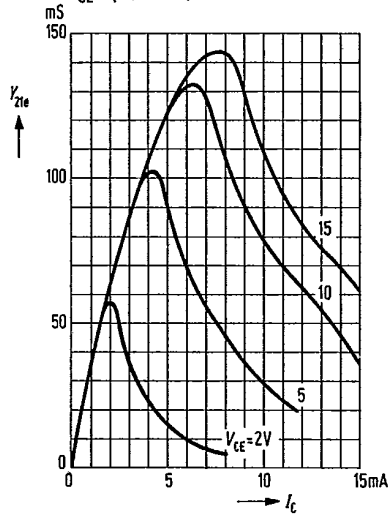


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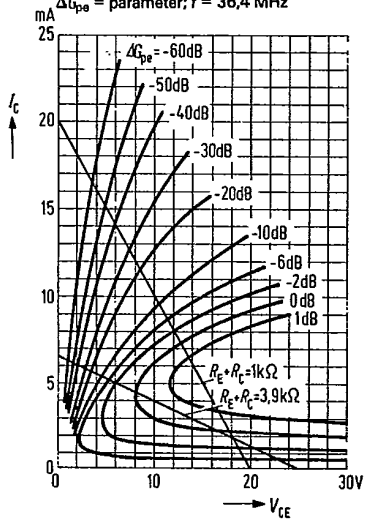
Transition frequency $f_T = f(I_C)$
 $V_{CE} = \text{parameter}$



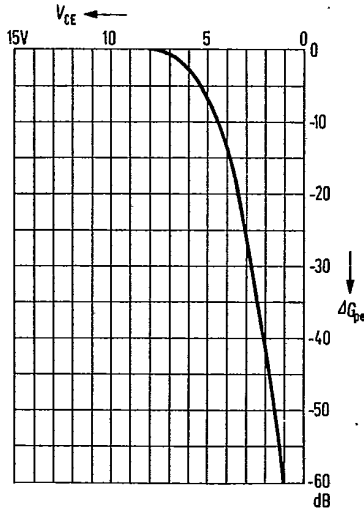
Short-circuit forward transfer admittance $y_{21e} = f(I_C)$
 $V_{CE} = \text{parameter}; f = 35 \text{ MHz}$



Constant power gain characteristics
 $I_C = f(V_{CE})$
 $\Delta G_{p0} = \text{parameter}; f = 36.4 \text{ MHz}$



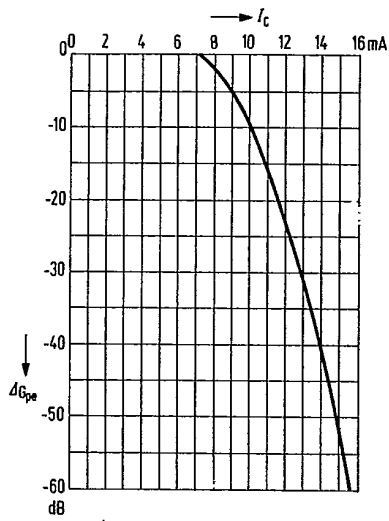
Power gain control range
 $\Delta G_{p0} = f(V_{CE}); R_E + R_C = 3.9 \text{ k}\Omega$
 $f = 36.4 \text{ MHz}; -V_{EE} = 25 \text{ V}$



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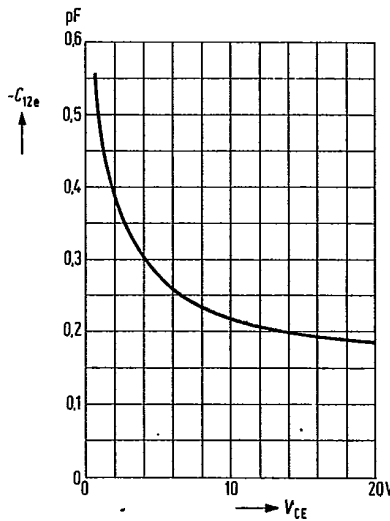
Control range of power gain

$\Delta G_{pe} = f(I_C); R_E + R_C = 1 \text{ k}\Omega;$
 $-V_{EE} = 20 \text{ V}; f = 36.4 \text{ MHz}$

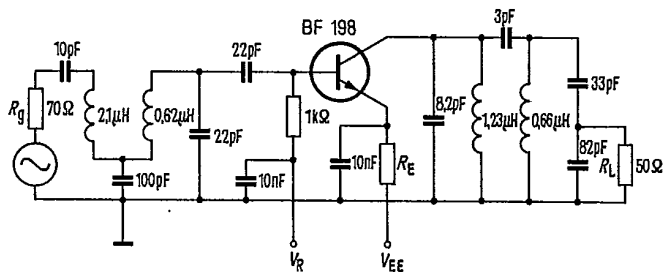


Reverse transfer capacitance

$C_{12e} = f(V_{CE}); I_C = 1 \text{ mA}; f = 1 \text{ MHz}$



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



Power gain ($I_C = 4 \text{ mA};$

$-V_{EE} = 25 \text{ V}; R_E + R_C = 3.9 \text{ k}\Omega$)

Gain control range

G_p	26	dB
ΔG_p	60	dB



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