SILICON PLANAR PNP

BF 509

VHF AGC AMPLIFIER

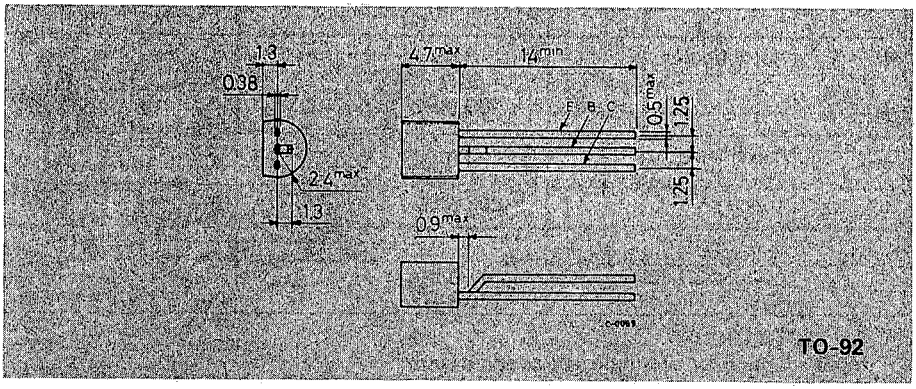
The BF 509 is a silicon planar epitaxial PNP transistor in Jedec TO-92 plastic package. It is intended for use as controlled VHF preamplifier when a high gain level with particularly reduced noise is required.

ABSOLUTE MAXIMUM RATINGS

V_{CBO}	Collector-base voltage ($I_E = 0$)	-40	V
V_{CEO}	Collector-emitter voltage ($I_B = 0$)	-35	V
V_{EBO}	Emitter-base voltage ($I_C = 0$)	-4	V
I_C	Collector current	-30	mA
I_B	Base current	-5	mA
P_{tot}	Total power dissipation at $T_{amb} \leqslant 45°C$	250	mW
T_{stg}	Storage temperature	-55 to 150	°C
T_j	Junction temperature	150	°C

MECHANICAL DATA

Dimensions in mm



BF 509

THERMAL DATA

$R_{th\ j\text{-}amb}$	Thermal resistance junction-ambient	max	420	°C/W

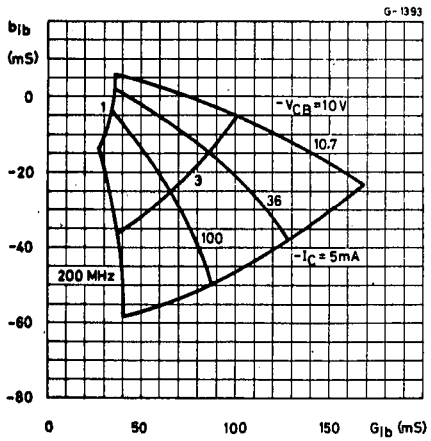
ELECTRICAL CHARACTERISTICS (T_{amb} = 25°C unless otherwise specified)

Parameter		Test conditions		Min.	Typ.	Max.	Unit
I_{CBO}	Collector cutoff current ($I_E = 0$)	V_{CB} = -20V				-200	nA
$V_{(BR)CEO}$	Collector-emitter breakdown voltage ($I_B = 0$)	I_C = -5 mA		-35			V
$V_{(BR)EBO}$	Emitter-base breakdown voltage ($I_C = 0$)	I_E = -10 μA		-4			V
h_{FE}	DC current gain	I_C = -3 mA	V_{CE} = -10V		70		—
f_T	Transition frequency	I_C = -3 mA f = 100 MHz	V_{CE} = -10V		700		MHz
C_{CBO}	Collector-base capacitance	$I_E = 0$ f = 1 MHz	V_{CB} = -10V		0.8		pF
C_{rb}	Reverse capacitance	$I_C = 0$ f = 1 MHz	V_{CB} = -10V		0.13		pF
NF*/**	Noise figure	I_C = -3 mA R_g = 50 Ω f = 200 MHz	V_{CC} = -10.8V		1.5	2.5	dB
G_{pb}*	Power gain	I_C = -3 mA R_L = 1 kΩ f = 200 MHz	V_{CC} = -10.8V	15	18		dB
$I_{C(AGC)}$*	Collector current for ΔG_{pb} = 30 dB	V_{CC} = 10.8V f = 200 MHz		7.3		8.8	mA

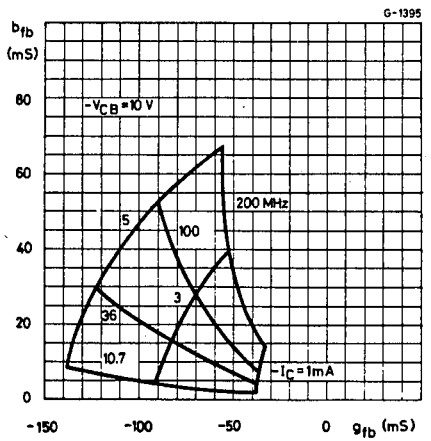
* See TEST CIRCUIT

** Input adapting for optimum source admittance.

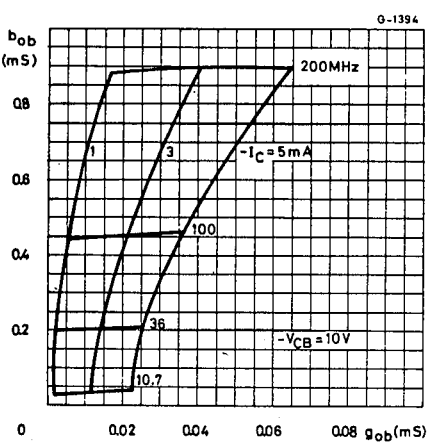
Typical input admittance



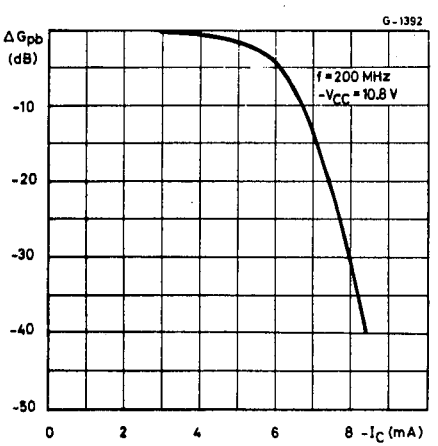
Typical transfer admittance



Typical output admittance



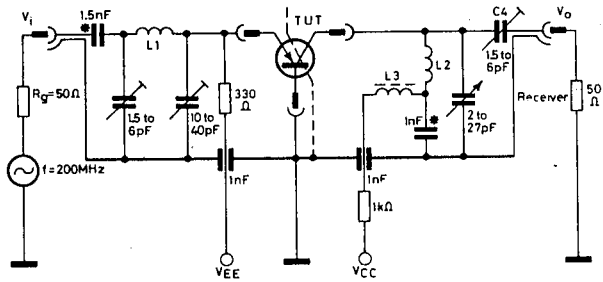
Typical power gain variation vs. AGC current



BF 509

TEST CIRCUIT

Power gain, AGC and noise figure



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* Leadless ceramic disc capacitor
L1 = 3 turns 0.6mm enamel, 4mm dia.
L2 = 2 turns 1mm enamel, 6.5mm dia.