

SILICON PLANAR PNP

VHF AGC AMPLIFIER

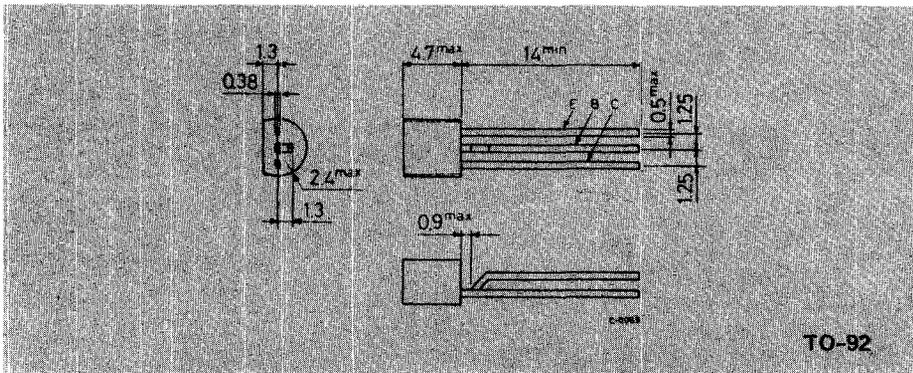
The BF 509 is a silicon planar epitaxial PNP transistor in Jedec TO-92 plastic package. It is intended for use as controlled VHF preamplifier when a high gain level with particularly reduced noise is required.

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 $T_{amb} \leq 45^\circ\text{C}$	250	mW
T_{stg}	Storage temperature	-55 to 150	$^\circ\text{C}$
T_j	Junction temperature	150	$^\circ\text{C}$

MECHANICAL DATA

Dimensions in mm



BF 509

THERMAL DATA

$R_{th\ j-amb}$	Thermal resistance junction-ambient	max	420 °C/W
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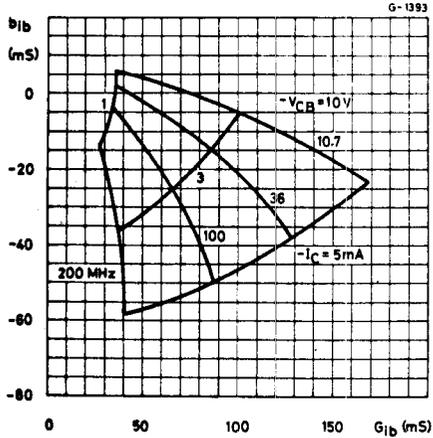
ELECTRICAL CHARACTERISTICS ($T_{amb} = 25^{\circ}\text{C}$ unless otherwise specified)

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

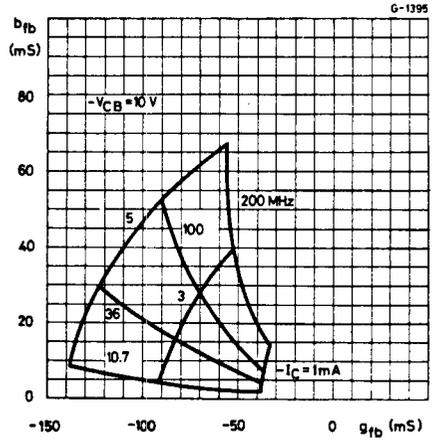
* See TEST CIRCUIT

** Input adapting for optimum source admittance.

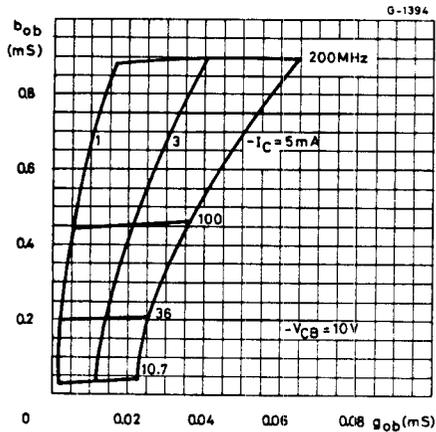
Typical input admittance



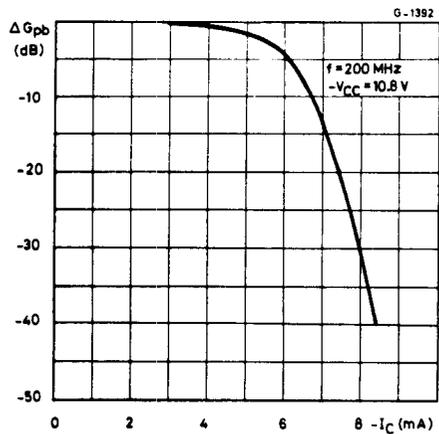
Typical transfer admittance



Typical output admittance



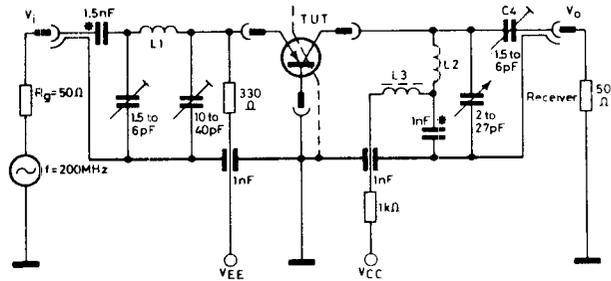
Typical power gain variation vs. AGC current



BF 509

TEST CIRCUIT

Power gain, AGC and noise figure



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

S-0877