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BF509

CASE 29-02, STYLE 17
TO-92 (TO-226AA)

VHF TRANSISTOR

PNP SILICON

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	35	Vdc
Collector-Base Voltage	V_{CBO}	40	Vdc
Emitter-Base Voltage	V_{EBO}	4.0	Vdc
Collector Current – Continuous	I_C	50	mAdc
Total Device Dissipation @ T_A = 25°C Derate above 25°C	P_D	350 2.8	mW mW/°C
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	1.0 8.0	Watt mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	−55 to +150	°C

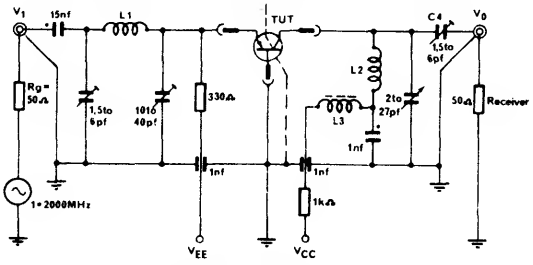
THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	125	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JC}$	357	°C/W

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

Characteristic	Symbol	Min.	Typ.	Max.	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage (I_C = 5.0 mAdc, I_B = 0)	$V_{(BR)CEO}$	35	—	—	Vdc
Collector-Base Breakdown Voltage (I_C = 100 μAdc, I_E = 0)	$V_{(BR)CBO}$	40	—	—	Vdc
Emitter-Base Breakdown Voltage (I_E = 100 μAdc, I_C = 0)	$V_{(BR)EBO}$	4	—	—	Vdc
Collector Cutoff Current (V_{CB} = 20 V, I_E = 0)	I_{CBO}	—	—	100	nAdc
ON CHARACTERISTICS					
DC Current Gain (I_C = 3 mAdc, V_{CE} = 10 Vdc)	h_{FE}	20	—	—	
SMALL SIGNAL CHARACTERISTICS					
Current-Gain – Bandwidth Product (I_C = 3 mAdc, V_{CE} = 10 Vdc, f = 100 MHz)	f_T	600	850	—	MHz
Feedback Capacitance (V_{CB} = 10 Vdc, I_E = 0, f = 1.0 MHz)	C_{rb}	—	0.15	0.25	pF
Collector-Base Capacitance (V_{CB} = 10 V, I_E = 0, f = 1.0 MHz)	$C_{CBO}(C_{re})$	—	0.6	0.9	pF
Noise Figure (I_C = 3 mAdc, V_{CC} = 10.8 V, R_S = 50 Ohms, f = 200 MHz)	N_F	—	—	2.5	dB
Common-Base Amplifier Power Gain (I_C = 3 mAdc, V_{CC} = 10.8 V, R_L = 1 KΩ, f = 200 MHz)	G_{pb}	15	22	—	dB
Forward AGC Current (I_C(Agc) (Gain Reduction = 30 dB, R_S = 50 Ohms, V_{CC} = 10.8 V, f = 200 MHz)	I_C(Agc)	7	—	8.8	mAdc

200 MHz POWER GAIN NOISE FIGURE TEST CIRCUIT



*Leadless ceramic disc capacitor
L1 = 3 turns 0.8 mm enamel, 4 mm dia
L2 = 2 turns 1 mm enamel, 6.5 mm dia

FIGURE 1 – DC CURRENT GAIN

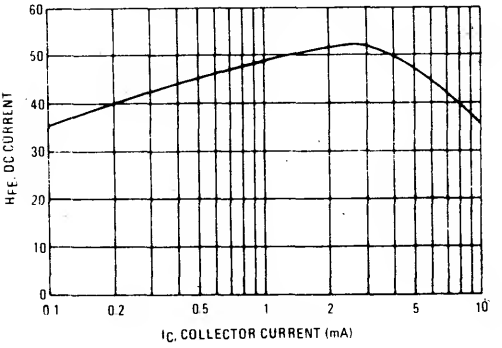


FIGURE 2 – CURRENT GAIN – BANDWIDTH PRODUCT

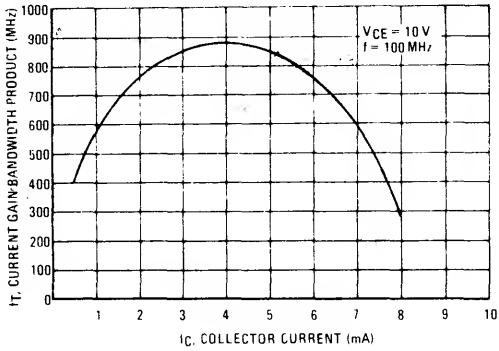


FIGURE 3 – CAPACITANCES

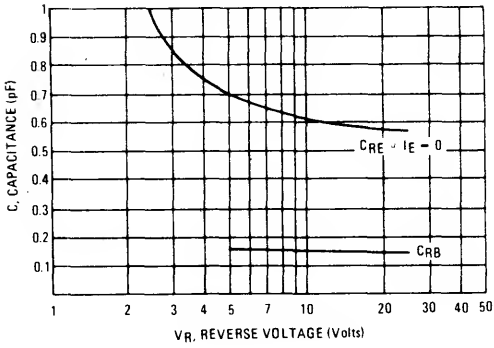


FIGURE 4 – TYPICAL POWER GAIN

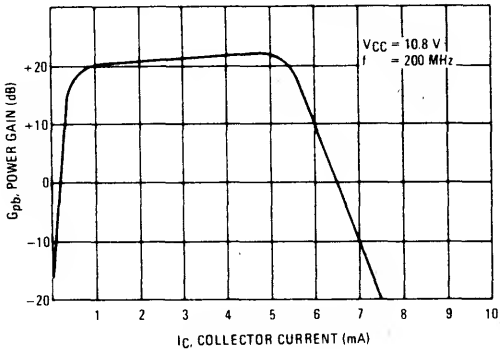


FIGURE 5 – FORWARD TRANSFER ADMITTANCE

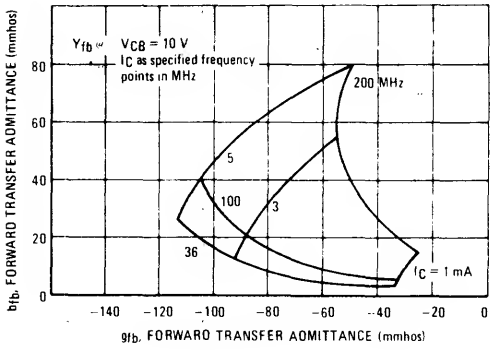


FIGURE 6 – INPUT ADMITTANCE