SGS-THOMSON MICROELECTRONICS

BFR99A

WIDE BAND VHF/UHF AMPLIFIER

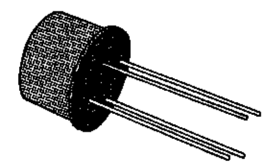
- SILICON PLANAR EPITAXAL TRANSISTOR
- TO-72 METAL CASE
- VERY LOW NOISE

APPLICATIONS :

- TELECOMMUNICATIONS
- WIDE BAND UHF AMPLIFIER
- RADIO COMMUNICATIONS

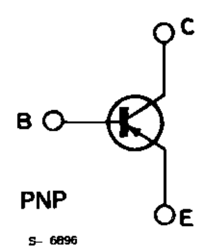
DESCRIPTION

The BRF99A is a silicon planar epitaxial PNP transistor produced using interdigitated base emitter geometry. It is particulary designed for use in wide band common-emitter linear amplifiers up to 1GHz. It features very high f_T, low reverse capacitance, excellent cross modulation properties and very low noise performance. The BFR99A is complementary to the BFY90. Typical applications include telecommunication and radio communication equipment.



TO-72

INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CBO}	Collector–base Voltage (I_E = 0)	– 25	V
V_{CEO}	Collector–emitter Voltage (I_B = 0)	– 25	V
V_{EBO}	Emitter–base Voltage (I_C = 0)	– 3	V
I_C	Collector Current	– 50	mA
P_{tot}	Total Power Dissipation at $T_{amb} \leq 25$ °C at $T_{case} \leq 25$ °C	225 360	mW mW
T_{stg}, T_j	Storage and Junction Temperature	– 55 to 200	°C

THERMAL DATA

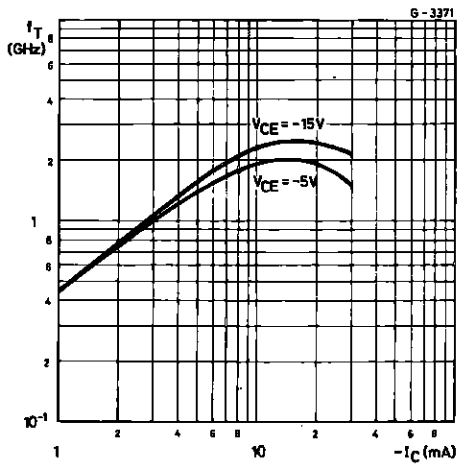
$R_{th\ j-case}$	Thermal Resistance Junction–case	Max	486	°C/W
$R_{th\ j-amb}$	Thermal Resistance Junction–ambient	Max	777	°C/W

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

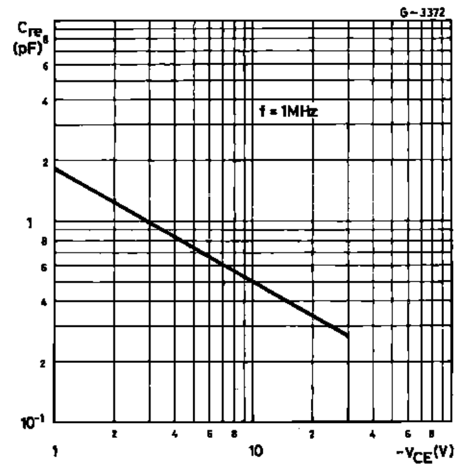
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector Cutoff Current (I_E = 0)	V_{CB} = – 15 V			– 100	nA
$V_{(BR)\ CBO}$	Collector–base Breakdown Voltage (I_E = 0)	I_C = – 100 μA	– 25			V
$V_{CEO\ (sus)}$*	Collector–emitter Sustaining Voltage (I_B = 0)	I_C = – 5 mA	– 25			V
$V_{(BR)\ EBO}$	Emitter–base Breakdown Voltage (I_C = 0)	I_E = – 10 μA	– 3			V
V_{CEK}**	Collector–emitter Knee Voltage	I_C = – 20 mA		– 0.8		V
V_{BE}	Base–emitter Voltage	I_C = – 10 mA V_{CE} = – 10 V		– 0.75		V
h_{FE}*	DC Current Gain	I_C = – 1 mA V_{CE} = – 10 V I_C = – 10 mA V_{CE} = – 10 V I_C = – 20 mA V_{CE} = – 10 V	 25 20	75 80		
f_T	Transition Frequency	I_C = – 10 mA V_{CE} = – 15 V f = 100 MHz	1.4	2.3		GHz
C_{re}	Reverse Capacitance	I_C = 0 V_{CE} = – 15 V f = 1 MHz		0.4		pF
NF	Noise Figure	I_C = – 3 mA V_{CE} = – 15 V R_g = 50 Ω f = 200 MHz f = 800 MHz I_C = – 10 mA V_{CE} = – 15 V R_g = 50 Ω f = 200 MHz f = 800 MHz		 2.5 3.5 3 4	 4 5	 dB dB dB dB
G_{pe}	Power Gain	I_C = – 10 mA V_{CE} = – 15 V f = 800 MHz		10		dB
P_o	Output Power	I_C = – 10 mA V_{CE} = – 15 V f = 800 MHz		14		mW
$\|S_{21e}\|^2$	Transcuder Power Gain	I_C = – 10 mA V_{CE} = – 15 V R_g = R_L = 50 Ω f = 800 MHz		8		dB

* Pulsed : pulse duration = 300μs, duty cycle = 1%
* * I_B = value corresponding to I_C = – 22mA and V_{CE} = – 1V.

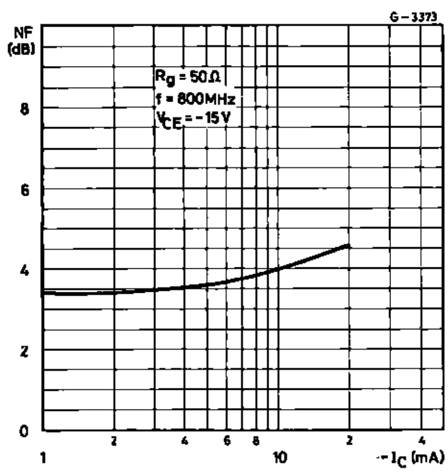
Transition Frequency.



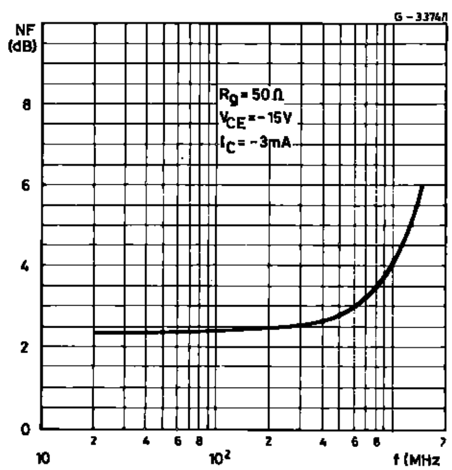
Reverse Capacitance.



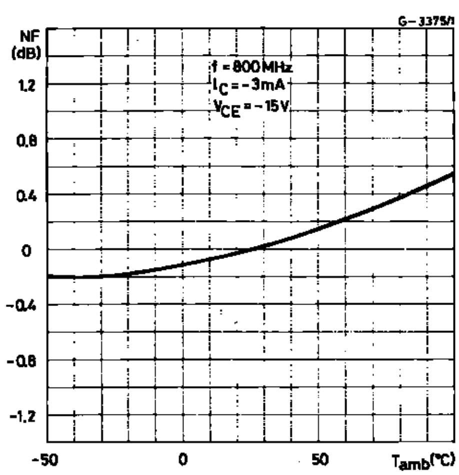
Noise Figure vs. Collector Current.



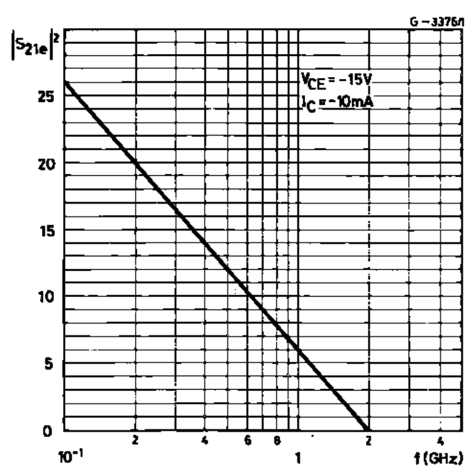
Noise Figure vs. Frequency.



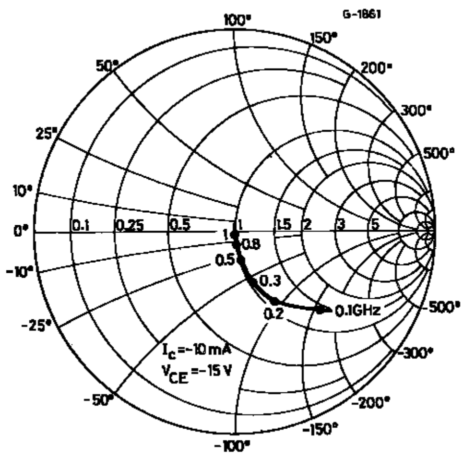
Noise Figure vs. Ambient Temperature.



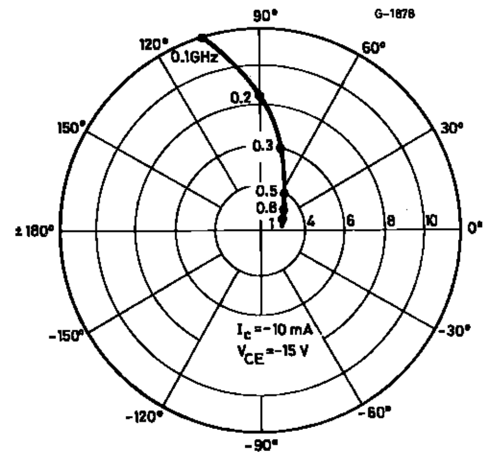
Transducer Power Gain.



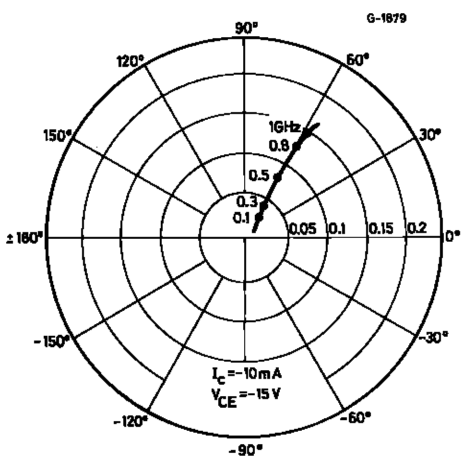
Input Impedance S_{11e} (50Ω normalized).



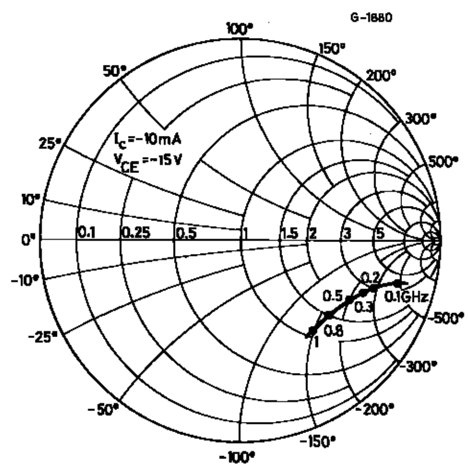
Forward Transfer Coefficient S_{21e}.



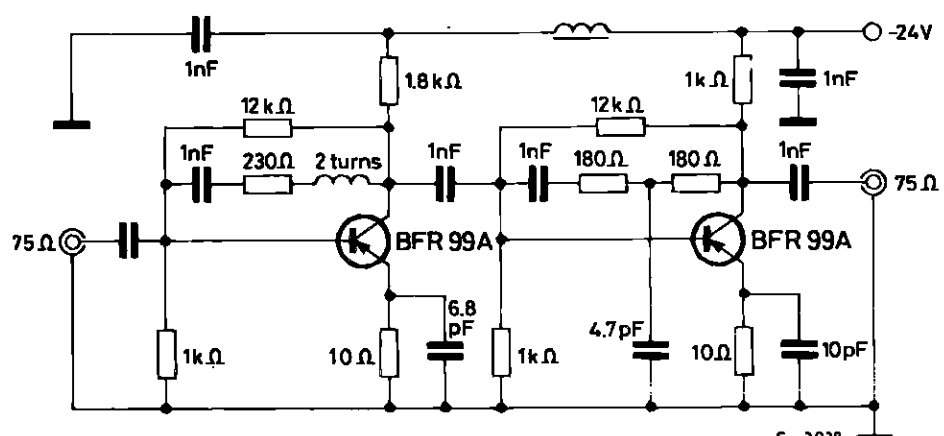
Reverse Transfer Coefficient S_{12e}.



Output Impedance S_{22e} (50Ω normalized).

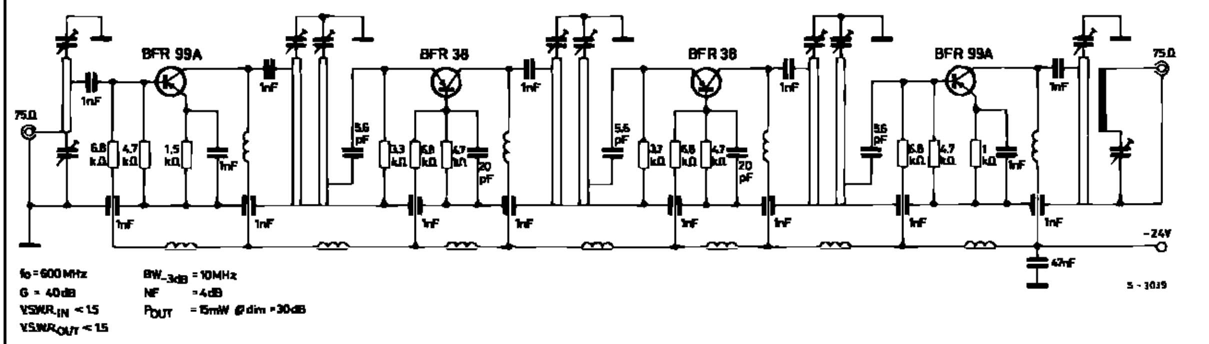


Wide Band MATV Amplifier.



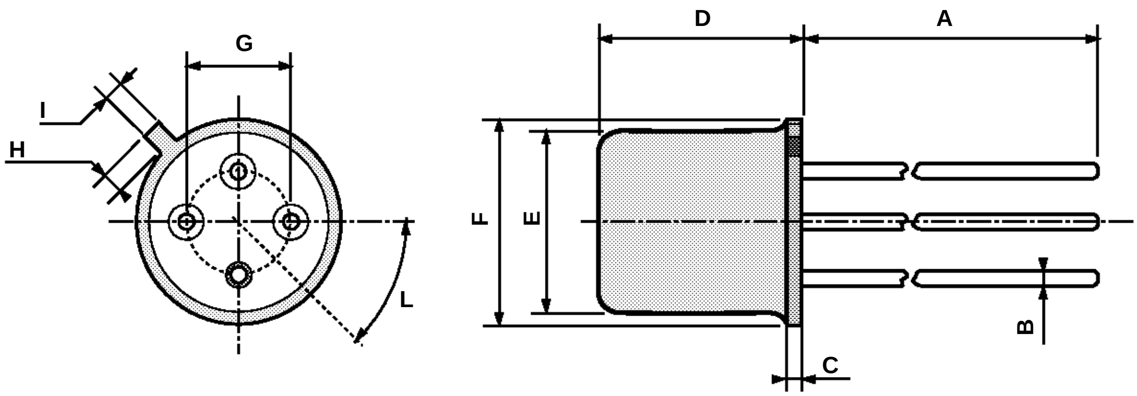
BW = 40 ÷ 860 MHz
G = 16 dB
NF < 5dB
V.S.W.R.$_{IN}$ < 2
V.S.W.R.$_{OUT}$ < 2
V_{OUT} = 100mV for 1% Crossmodulation

MATV Channel Amplifier.



TO-72 MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A		12.7			0.500	
B			0.49			0.019
D			5.3			0.208
E			4.9			0.193
F			5.8			0.228
G	2.54			0.100		
H			1.2			0.047
I			1.16			0.045
L	45^o			45^o		



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