SILICON PLANAR PNP

BFR 38

LOW-NOISE UHF/VHF AMPLIFIER

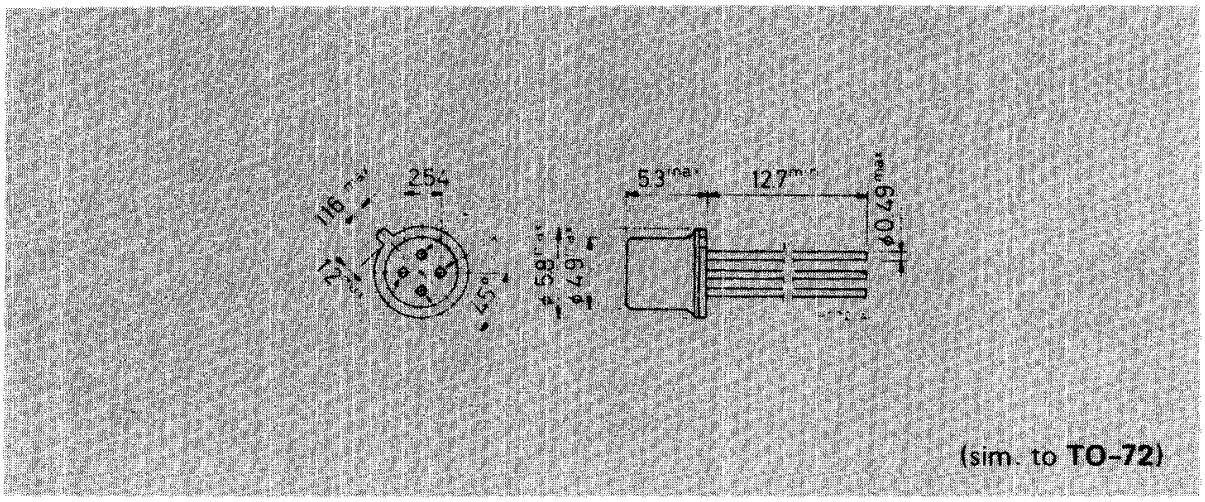
The BFR38 is a silicon planar epitaxial PNP transistor in Jedec TO-72 metal case. It is intended for very low noise TV aerial amplifiers and MATV preamplifier applications up to 1 GHz.

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 ($I_C = 0$)	-3	V
I_C	Collector current	-20	mA
P_{tot}	Total power dissipation at $T_{amb} \leqslant 25°C$	200	mW
	at $T_{amb} \leqslant 45°C$	175	mW
T_{stg}, T_j	Storage and junction temperature	-55 to 200	°C

MECHANICAL DATA

Dimensions in mm



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THERMAL DATA

$R_{th\ j\text{-}amb}$	Thermal resistance junction-ambient	max	875	°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 V_{CB} = -20V	 T_{amb} = 150°C		-0.1 -0.1	-50	nA μA
$V_{(BR)CBO}$	Collector-base breakdown voltage (I_E = 0)	I_C = -10μA		-40			V
$V_{CEO(sus)}$ *	Collector-emitter sustaining voltage (I_B = 0)	I_C = -5mA		-35			V
$V_{(BR)EBO}$	Emitter-base breakdown voltage (I_C = 0)	I_E = -10μA		-3			V
V_{BE}	Base-emitter voltage	I_C = -3mA	V_{CE} = -10V		-0.75		V
h_{FE} *	DC current gain	I_C = -3mA	V_{CE} = -10V	25	50		–
f_T	Transition frequency	I_C = -3mA f = 100 MHz	V_{CE} = -10V	0.7	1		GHz
C_{rb}	Reverse capacitance	I_C = 0 f = 1MHz	V_{CB} = -10V		0.05	0.09	pF
$-C_{re}$	Reverse capacitance	I_C = 0 f = 1MHz	V_{CE} = -10V		0.3		pF
NF	Noise figure	I_C = -3mA R_g = 50Ω	V_{CB} = -10V f = 200 MHz f = 500 MHz f = 800 MHz		 2.5 2.7 3.5	 4.5	 dB dB dB
G_{pb}	Power gain	I_C = -3mA	V_{CB} = -10V f = 200 MHz f = 500 MHz f = 800 MHz		 19 16 14		 dB dB dB

* Pulsed: pulse duration = 300μs, duty cycle = 1%

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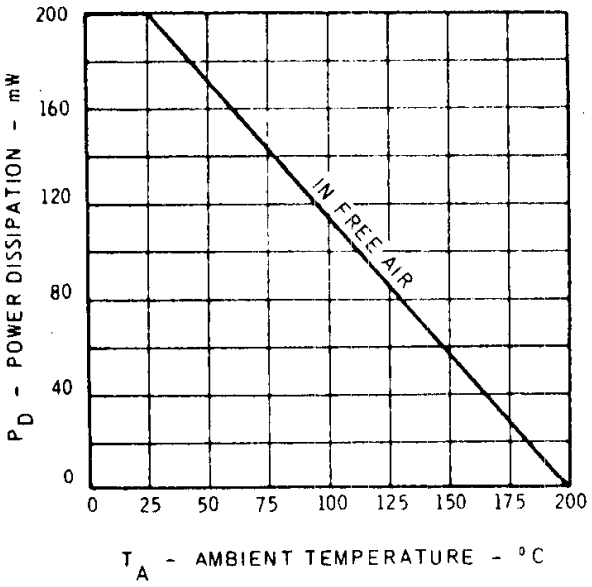
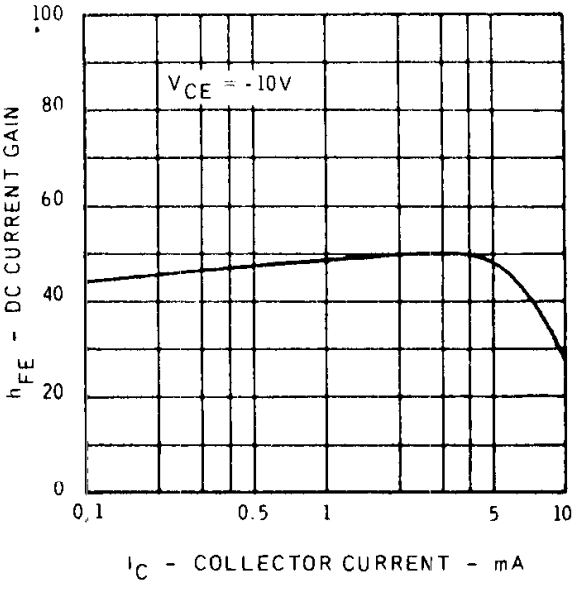
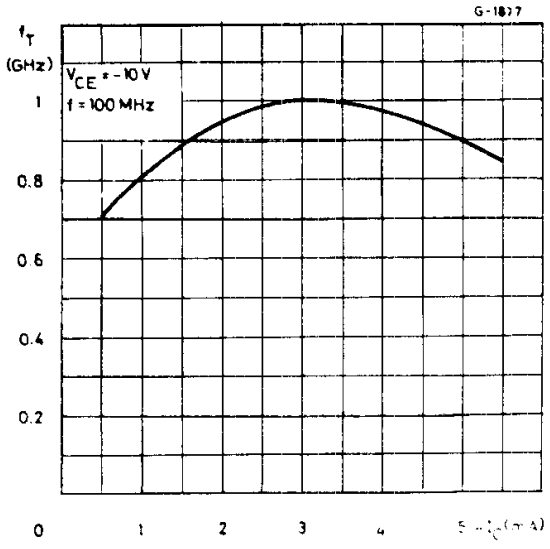
Power rating chart



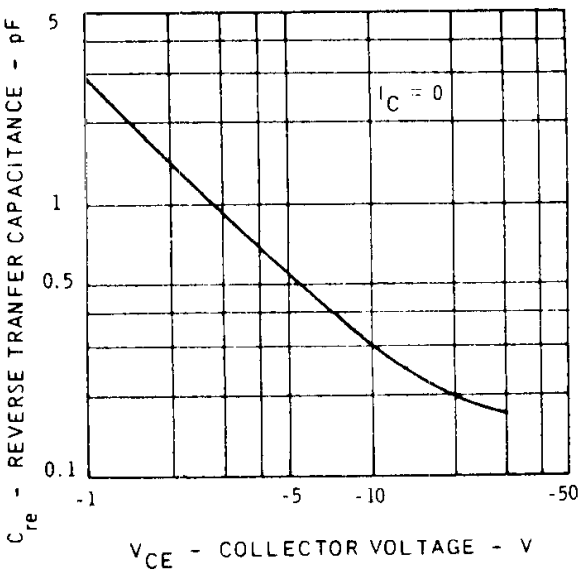
DC current gain



Transition frequency



Reverse capacitance



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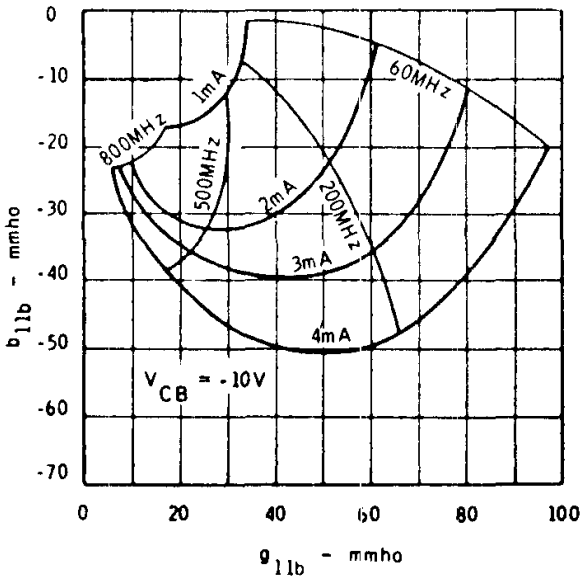
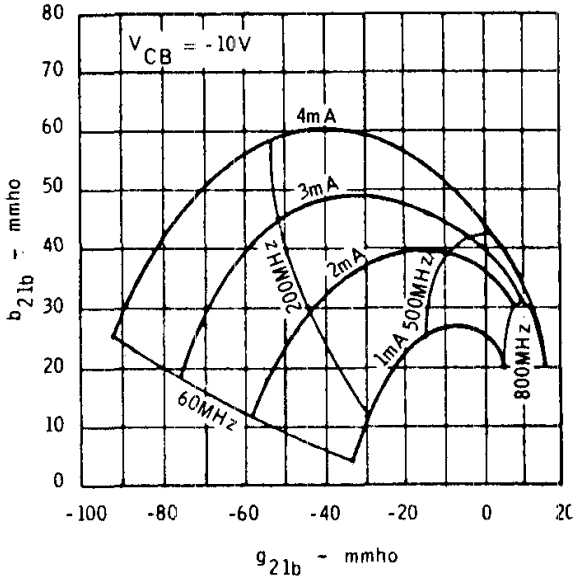
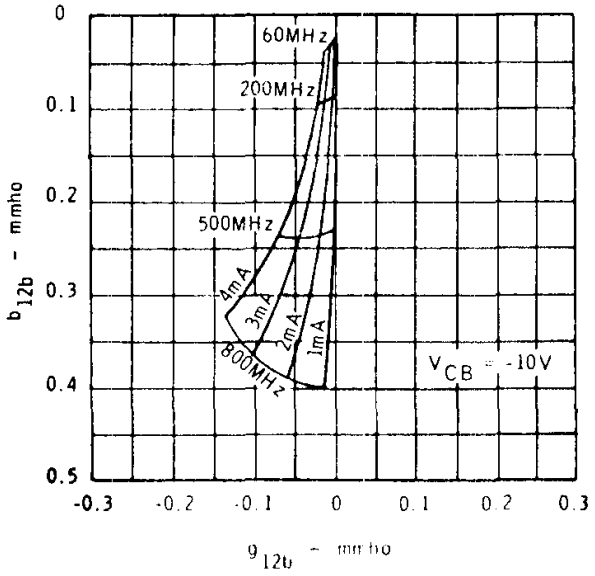
Input admittance



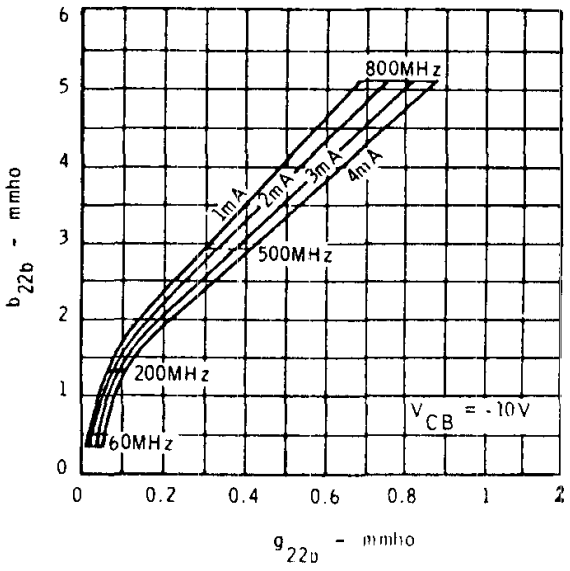
Forward transadmittance



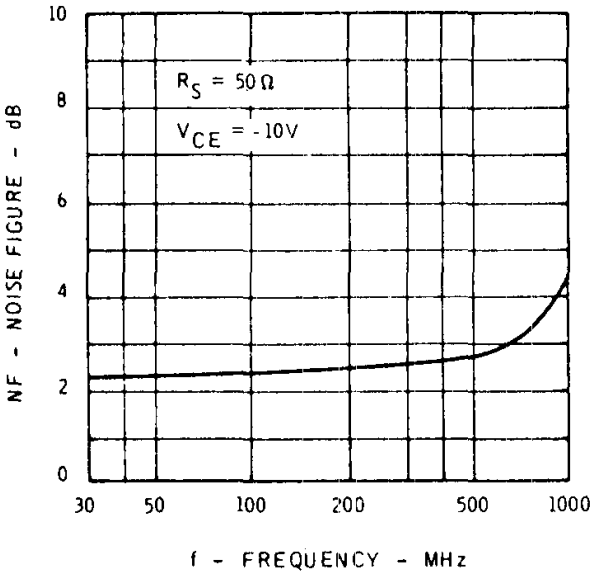
Reverse transadmittance



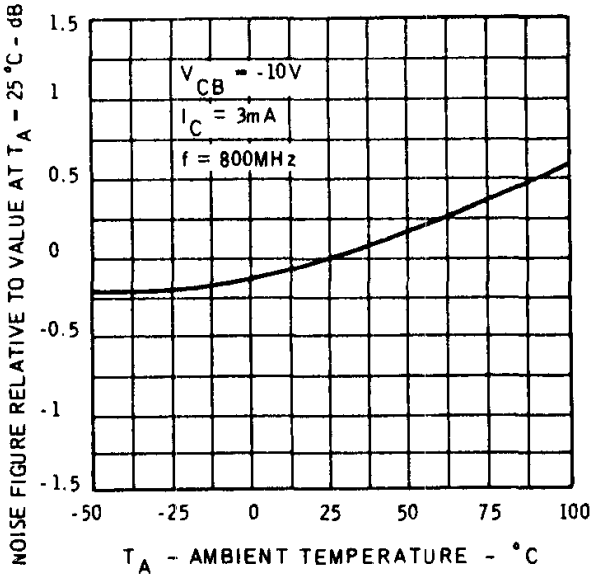
Output admittance



Noise figure vs. frequency

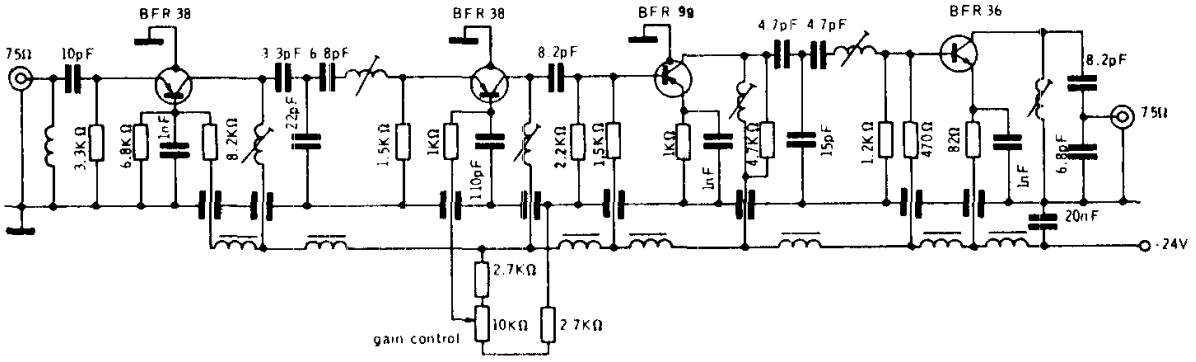


Noise figure vs. ambient temperature



TYPICAL APPLICATIONS

MATV 200 MHz channel amplifier



Supply Voltage	-24V	V.S.W.R $_{IN}$	<1.5
Current Drain	110mA	V.S.W.R $_{OUT}$	<2
PG	70dB	P_{OUT} = 120mW at dim = -30 dB	
NF	3dB	Gain Control	-30dB

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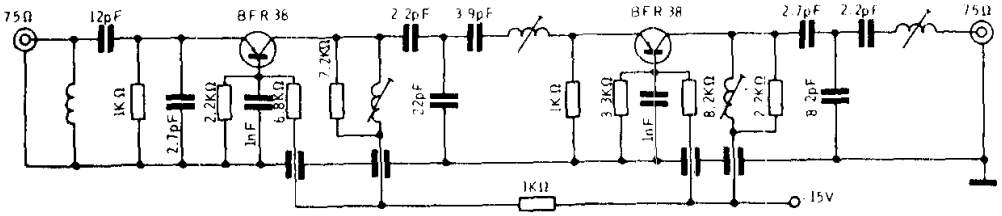
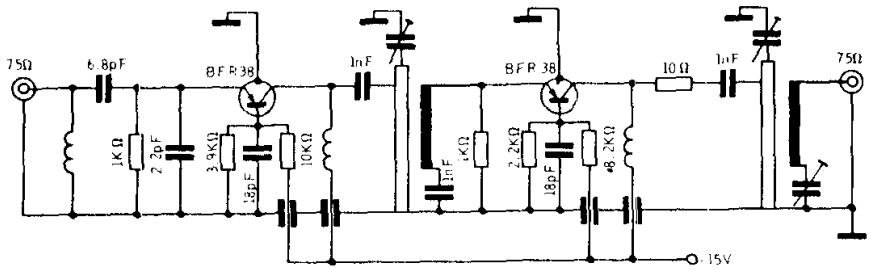
TYPICAL APPLICATIONS (continued)

213 MHz VHF aerial amplifier (TV - Ch. 10)



Supply Voltage	15V	NF	3dB
Current Drain	8mA	V.S.W.R. IN	<1.5
PG	28dB	V.S.W.R. OUT	<1.5

800 MHz VHF aerial-amplifier (TV - Ch. 62)



Supply Voltage	15V	NF	4dB
Current Drain	8mA	V.S.W.R. IN	<2
PG	26dB	V.S.W.R. OUT	<1.5