

Low-noise UHF/VHF amplifier

The BFR 38 is a PNP silicon planar epitaxial transistor designed as very low noise UHF/VHF amplifier up to 1GHz. The BFR 38 is particularly intended for TV aerial amplifiers and MATV preamplifier applications.

ELECTRICAL CHARACTERISTICS

($T_A = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Characteristic and test conditions	Min.	Typ.	Max.	Unit
h_{FE}	DC Current Gain (5) $I_C = 3\text{mA}$ $V_{CE} = -10\text{V}$	25	50		
V_{BEon}	Base-Emitter On Voltage $I_C = 3\text{mA}$ $V_{CE} = -10\text{V}$	-0.75			V
I_{CBO}	Collector Reverse Current $V_{CB} = -20\text{V}$ $I_E = 0$ $T_A = 150^\circ\text{C}$	0.1	50		nA
BV_{CBO}	Collector to Base Breakdown Voltage $I_C = 10\mu\text{A}$ $I_E = 0$	-40			V
BV_{EBO}	Emitter to Base Breakdown Voltage $I_E = 10\mu\text{A}$ $I_C = 0$	-3			V
LV_{CEO}	Collector to Emitter Sustaining Voltage (4 and 5)	-35			V
h_{fe}	High Freq. Current Gain $V_{CE} = -10\text{V}$ $I_C = 3\text{mA}$ $f = 100\text{MHz}$	7	8.5		
C_{re}	Reverse Transfer Capacitance $I_C = 0$ $V_{CE} = -10\text{V}$ $f = 1\text{MHz}$	0.3			pF
C_{rb}	Common Base Feedback Capacitance $I_C = 0$ $V_{CB} = -10\text{V}$ $f = 1\text{MHz}$	0.05	0.09		pF
NF	Noise Figure (6) $V_{CB} = -10\text{V}$		2.5		dB
NF	Narrow Band Noise Figure $I_C = 3\text{mA}$ $V_{CB} = -10\text{V}$ (7)		2.7		dB
	$I_C = 3\text{mA}$ $V_{CB} = -10\text{V}$ (8)		3.5	5.5	dB
PG	Power Gain $I_C = 3\text{mA}$ $V_{CB} = -10\text{V}$ $f = 200\text{MHz}$		19		dB
	$I_C = 3\text{mA}$ $V_{CB} = -10\text{V}$ $f = 500\text{MHz}$		16		dB
	$I_C = 3\text{mA}$ $V_{CB} = -10\text{V}$ $f = 800\text{MHz}$	11	14		dB

ABSOLUTE MAXIMUM RATINGS (1)

($T_A = 25^\circ\text{C}$ unless otherwise noted)

Voltages and Current

Collector to Base	V_{CBO}	-40 V
Collector to Emitter (4)	V_{CEO}	-35 V
Emitter to Base	V_{EBO}	-3 V
DC Collector Current	I_C	20 mA

Temperatures

Storage Temperature Range	T_{STG}	-55°C to 200°C
Operating Junction Temperature	T_J	200°C
Lead Temperature (Soldering, 10 sec. time limit)	T_L	260°C

Power (2 and 3)

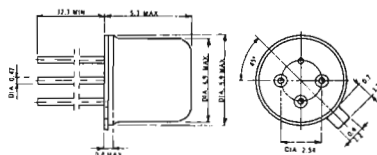
Dissipation at 25°C		
Ambient Temperature	P_D	200 mW
Dissipation at 45°C		
Ambient Temperature	P_D	175 mW

NOTES:

- 1) These ratings are limiting values above which the serviceability of any individual semiconductor device may be impaired.
- 2) These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.
- 3) These ratings give a maximum junction temperature of 200°C and junction-to-ambient thermal resistance of 875°C/W (derating factor of $1.14\text{ mW}/^\circ\text{C}$).
- 4) These ratings refer to a high-current point where collector-to-emitter voltage is lowest. For more information send for SGS AR5.
- 5) Measured under pulse conditions: pulse length = $300\text{ }\mu\text{s}$; duty cycle = 1% .
- 6) $f = 200\text{ MHz}$; $R_S = 50\text{ }\Omega$
- 7) $f = 500\text{ MHz}$; $R_S = 50\text{ }\Omega$
- 8) $f = 800\text{ MHz}$; $R_S = 50\text{ }\Omega$

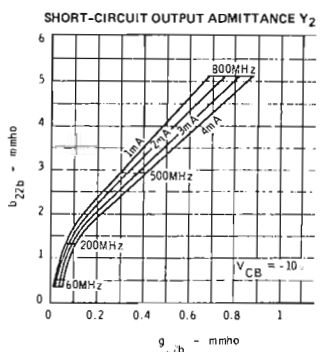
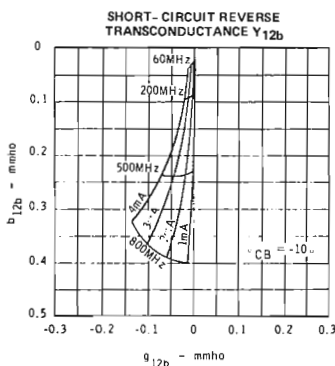
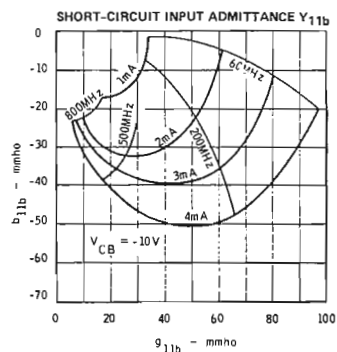
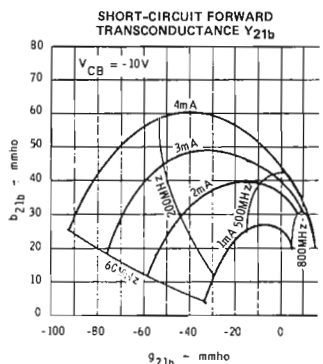
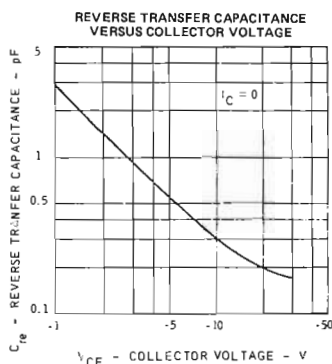
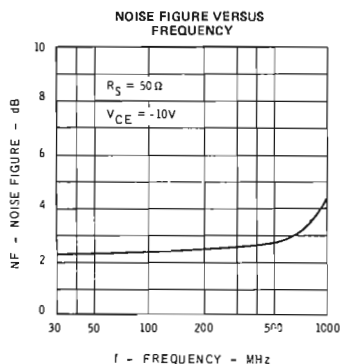
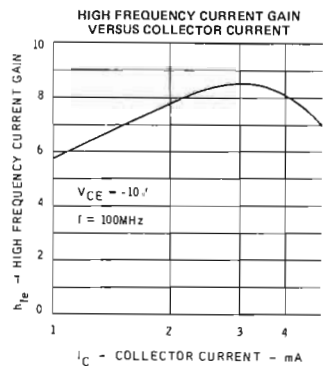
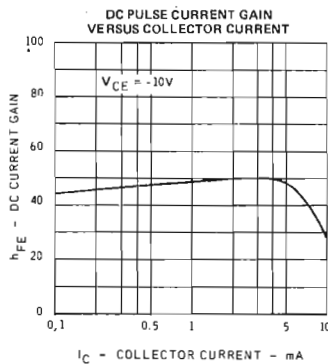
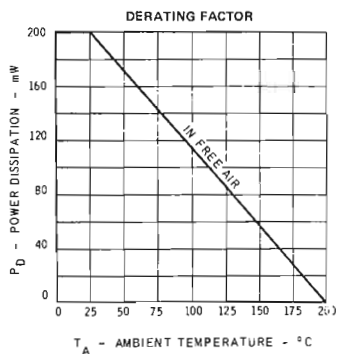
PHYSICAL DIMENSIONS

in accordance with
JEDEC TO-72 outline

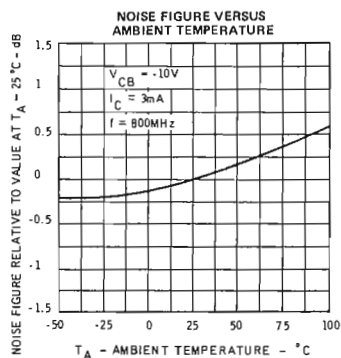
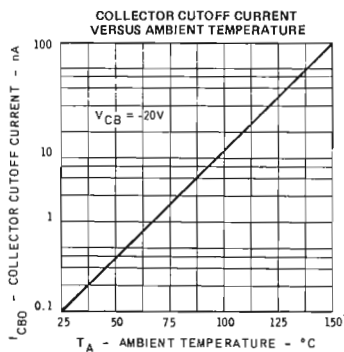


Note: all dimensions in mm.

TYPICAL ELECTRICAL CHARACTERISTICS (25°C free air temperature unless otherwise noted)

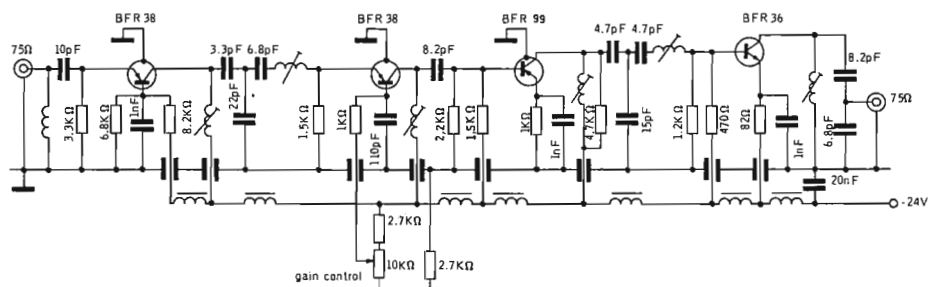


TYPICAL ELECTRICAL CHARACTERISTICS (25°C free air temperature unless otherwise noted)



TYPICAL APPLICATIONS:

MATV 200MHz CHANNEL AMPLIFIER



Supply Voltage: -24V

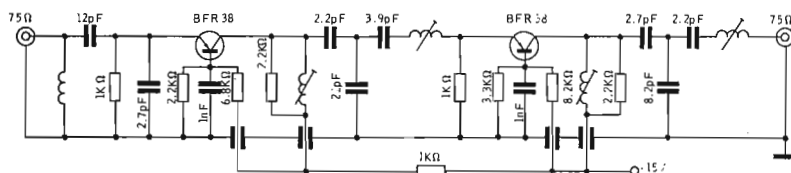
Current Drain: 110mA

PG: 70dB

NF: 3dB

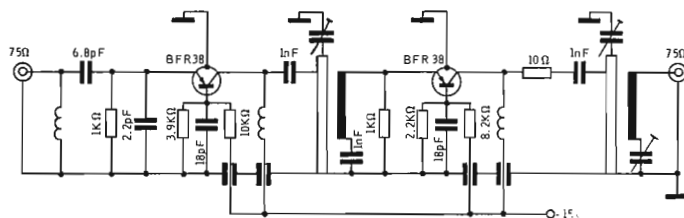
V.S.W.R._{IN}: <1.5V.S.W.R._{OUT}: <2 $P_{OUT} = 120mW$ at dim = -30 dB

Gain Control: >30dB

TYPICAL APPLICATIONS (Contd.)**213MHz VHF AERIAL AMPLIFIER (TV - CH. 10)**

Supply Voltage : -15V
 Current Drain : 8mA
 PG : 26dB

NF : 3dB
 V.S.W.R._{IN} : <1.5
 V.S.W.R._{OUT} : <1.5

800MHz UHF AERIAL AMPLIFIER (TV - CH. 62)

Supply Voltage : -15V
 Current Drain : 8mA
 PG : 26dB

NF : 4dB
 V.S.W.R._{IN} : <2
 V.S.W.R._{OUT} : <1.5