NPN multi-emitter silicon planar transistor

BFR 98-2N4427

VHF oscillator power amplifier

The BFR 98/2N 4427 is a NPN, silicon planar epitaxial transistor designed for VHF class A, B, or C amplifier and oscillator applications.

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

Symbol	Characteristic and test conditions	Min.	Typ.	Max.	Unit
h_{FE}	DC Current Gain (5)				
	I_C = 100 mA V_{CE} = 5V	10		200	
	I_C = 360 mA V_{CE} = 5V	5			
$V_{CE\,sat}$	Collector Saturation Voltage (5)				
	I_C = 100 mA I_B = 20 mA			0.5	V
I_{CEO}	Collector Reverse Current				
	V_{CE} = 12V I_B = 0			20	μA
BV_{CBO}	Collector to Base Breakdown Voltage				
	I_C = 100 μA I_E = 0	40			V
BV_{EBO}	Emitter to Base Breakdown Voltage				
	I_E = 100 μA I_C = 0	3.5			V
LV_{CER}	Collector to Emitter Sustaining Voltage (4 and 5)				
	I_C = 5 mA R_{BE} = 10Ω	40			V
LV_{CEO}	Collector to Emitter Sustaining Voltage (4 and 5)				
	I_C = 5 mA I_B = 0	20			V
h_{fe}	High Freq. Current Gain				
	I_C = 50 mA V_{CE} = 15V f = 200 MHz	2.5			
C_{obo}	Base-Collector Capacitance				
	I_E = 0 V_{CB} = 12V f = 1 MHz			4	pF
P_o	RF Power Output				
	P_{in} = 100mW V_{CC} = 12V f = 175 MHz See Fig. 1	1			W
η	Collector Efficiency				
	P_{out} = 1 W V_{CC} = 12V f = 175 MHz See Fig. 1	50			%

ABSOLUTE MAXIMUM RATINGS (1)
(T_A = 25°C unless otherwise noted)

Voltages

Collector to Base	V_{CBO}	40 V
Collector to Emitter (4)	V_{CEO}	20 V
Emitter to Base	V_{EBO}	3.5 V

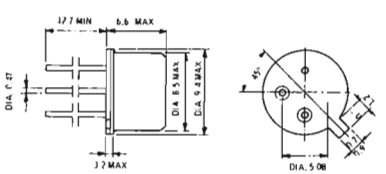
Temperatures

Storage Temperature Range	T_{STG}	-65°C to +200°C
Operating Junction Temperature	T_J	+200°C

Power (2 and 3)

Dissipation at 25°C Case Temperature	P_D	3.5 W

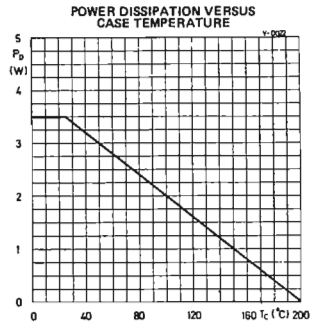
PHYSICAL DIMENSIONS
Similar to
JEDEC TO-39 outline

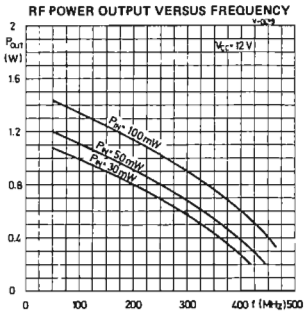


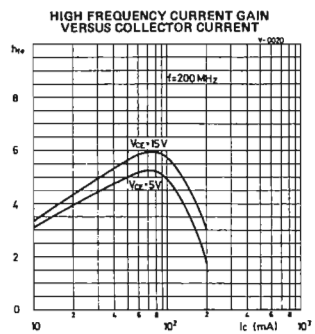
Note: all dimensions in mm.

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-case thermal resistance of 50°C/W (derating factor of 20 mW/°C).
4) These ratings refer to a high-current point where collector-to-emitter voltage is lowest. For more information send for SGS – AR 5.
5) Measured under pulse conditions: pulse length = 300 μsec; duty cycle = 1%.

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







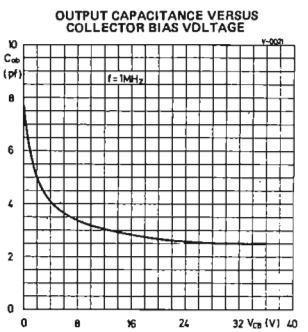
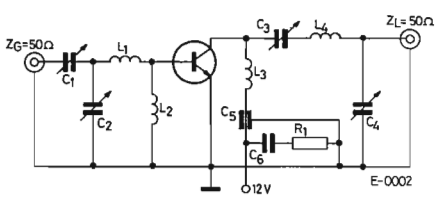


FIG. 1 - RF AMPLIFIER CIRCUIT FOR POWER OUTPUT TEST
(175 MHz OPERATION)



C_1, C_2, C_3, C_4 = 3 - 30 pF
C_5 = 1000 pF
C_6 = 20 KpF
R_1 = 10Ω

L_1 = 2 turns 16 wire, 3/16 "ID, 1/4" long
L_2 = ferrite choke, Z = 450Ω
L_3 = 2 turns 16 wire, 1/4 "ID, 1/4" long
L_4 = 4 turns 16 wire, 3/8 "ID, 3/8" long