The RF Line

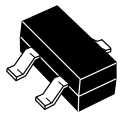
NPN Silicon High-Frequency Transistors

BFR93ALT1

Designed primarily for use in high–gain, low–noise, small–signal UHF and microwave amplifiers constructed with thick and thin–film circuits using surface mount components.

- T1 Suffix Indicates Tape and Reel Packaging of 3,000 Units per Reel.

RF TRANSISTORS
NPN SILICON



CASE 318–08, STYLE 6
SOT–23
LOW PROFILE

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector–Emitter Voltage	V_{CEO}	12	Vdc
Collector–Base Voltage	V_{CBO}	15	Vdc
Emitter–Base Voltage	V_{EBO}	2.0	Vdc
Collector Current — Continuous	I_C	35	mAdc
Maximum Junction Temperature	T_{Jmax}	150	°C
Power Dissipation, T_{case} = 75°C (2) Derate linearly above T_{case} = 75°C @	$P_{D(max)}$	0.306 4.08	W mW/°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Storage Temperature	T_{stg}	–55 to +150	°C
Thermal Resistance Junction to Case	$R_{\theta JC}$	245	°C/W

DEVICE MARKING

BFR93ALT1 = R2

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

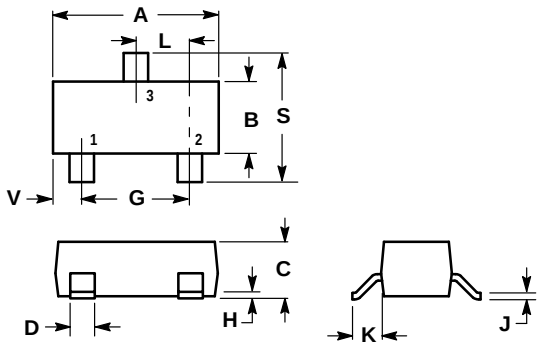
Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector–Emitter Breakdown Voltage (1) (I_C = 10 mA)	$V_{(BR)CEO}$	12	—	Vdc
Collector–Base Breakdown Voltage (I_C = 10 μA)	$V_{(BR)CBO}$	15	—	Vdc
Emitter–Base Breakdown Voltage (I_C = 100 μA)	$V_{(BR)EBO}$	2.0	—	Vdc
Collector Cutoff Current (V_{CE} = 10 V)	I_{CEO}	—	50	nA
Collector Cutoff Current (V_{CB} = 10 V)	I_{CBO}	—	50	nA
ON CHARACTERISTICS				
DC Current Gain (1) (I_C = 30 mA, V_{CE} = 5.0 V)	h_{FE}	40	—	—
Collector–Emitter Saturation Voltage (1) (I_C = 35 mA, I_B = 7.0 mA)	$V_{CE(sat)}$	—	0.5	Vdc
Base–Emitter Saturation Voltage (1) (I_C = 35 mA, I_B = 7.0 mA)	$V_{BE(sat)}$	—	1.2	Vdc

NOTES:
1. Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.
2. Case temperature measured on collector lead immediately adjacent to body of package.

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

Characteristic	Symbol	Min	Max	Unit
SMALL–SIGNAL CHARACTERISTICS				
Current–Gain — Bandwidth Product (I_C = 30 mA, V_{CE} = 5.0 V, f = 500 MHz)	f_T	3.0	—	GHz
Noise Figure (V_{CE} = 5.0 V, I_C = 2.0 mA, R_S = 50 Ω, f = 30 MHz)	NF	—	3.0	dB

PACKAGE DIMENSIONS



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.1102	0.1197	2.80	3.04
B	0.0472	0.0551	1.20	1.40
C	0.0350	0.0440	0.89	1.11
D	0.0150	0.0200	0.37	0.50
G	0.0701	0.0807	1.78	2.04
H	0.0005	0.0040	0.013	0.100
J	0.0034	0.0070	0.085	0.177
K	0.0140	0.0285	0.35	0.69
L	0.0350	0.0401	0.89	1.02
S	0.0830	0.1039	2.10	2.64
V	0.0177	0.0236	0.45	0.60

STYLE 6:
PIN 1. BASE
2. EMITTER
3. COLLECTOR

CASE 318–08
ISSUE AF

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