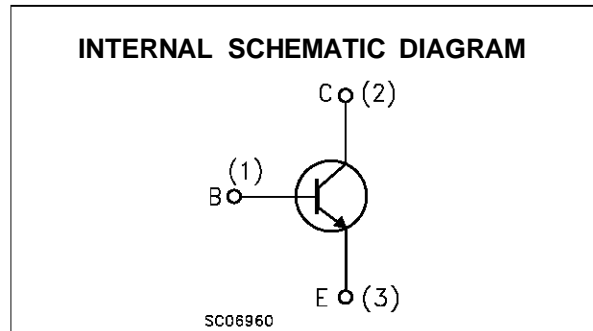


SMALL SIGNAL NPN RF TRANSISTOR

Type	Marking
BFR93	R1
BFR93A	R2

- SILICON EPITAXIAL PLANAR NPN TRANSISTORS
- MINIATURE PLASTIC PACKAGE FOR APPLICATION IN SURFACE MOUNTING CIRCUITS
- GOLD METALLIZED TRANSISTOR FOR HIGH GAIN AND LOW NOISE, PARTICULARLY FOR UHF APPLICATION UP TO 1GHz



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-Base Voltage ($I_E = 0$)	15	V
V_{CEO}	Collector-Emitter Voltage ($I_B = 0$)	12	V
V_{EBO}	Emitter-Base Voltage ($I_C = 0$)	2	V
I_C	Collector Current	35	mA
I_{CM}	Collector Peak Current	50	mA
I_B	Base Current	10	A
P_{tot}	Total Dissipation at $T_c = 25\text{ }^\circ\text{C}$	200	mW
T_{stg}	Storage Temperature	-65 to 150	$^\circ\text{C}$
T_j	Max. Operating Junction Temperature	150	$^\circ\text{C}$

BFR93/BFR93A

THERMAL DATA

$R_{thj-amb}$	Thermal Resistance Junction-Ambient	Max	500	$^{\circ}\text{C}/\text{W}$
R_{thj-SR}	Thermal Resistance Junction-Substrate	Max	400	$^{\circ}\text{C}/\text{W}$

• Mounted on a ceramic substrate area = 0.7 mm x 2.5 cm²

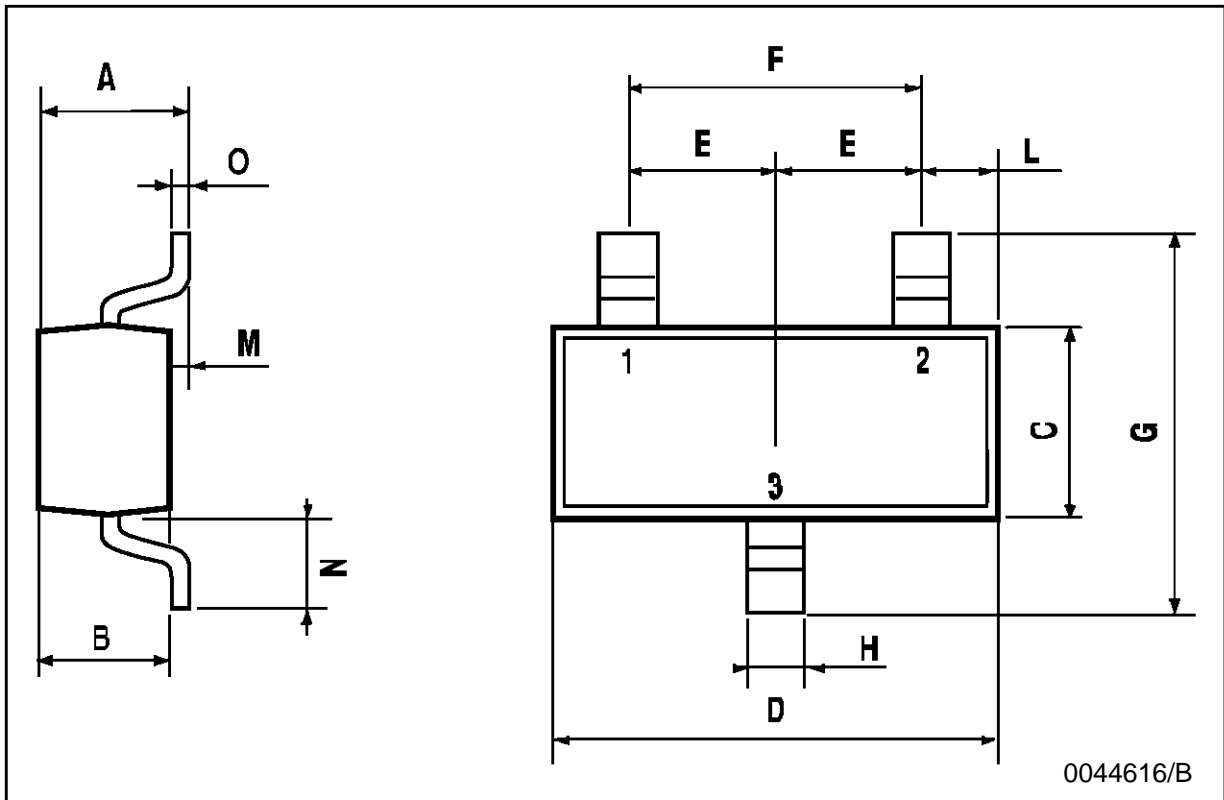
ELECTRICAL CHARACTERISTICS (T_{case} = 25 °C unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector Cut-off Current (I _E = 0)	V _{CB} = 5 V			50	nA
I_{CEO}	Collector Cut-off Current (I _E = 0)	V _{CE} = 10 V for BFR93A			50	nA
I_{EBO}	Emitter Cut-off Current (I _E = 0)	V _{EB} = 1 V for BFR93A			10	nA
V _{(BR)CBO} *	Collector-Base Breakdown Voltage (I _E = 0)	I _C = 10 μA	15			V
V _{(BR)CEO} *	Collector-Emitter Breakdown Voltage (I _B = 0)	I _C = 1 mA	12			V
V _{(BR)EBO}	Emitter-Base Breakdown Voltage (I _C = 0)	I _C = 10 μA	2			V
h _{FE} *	DC Current Gain	I _C = 30 mA V _{CE} = 5 V for BFR93 for BFR93A	25 40			
f _T	Transition Frequency	I _C = 30 mA V _{CE} = 5 V f = 500 MHz		5		GHz
C _{EB}	Emitter Base Capacitance	I _E = 0 V _{CE} = 5 V f = 1MHz		0.6		pF
C _{CB}	Collector Base Capacitance	I _E = 0 V _{CB} = 10 V f = 1MHz for BFR93 for BFR93A		0.8 0.7		pF pF
NF	Noise Figure	I _C = 4 mA V _{CE} = 8 V f = 800 MHz f = 500 MHz for BFR93 f = 800 MHz for BFR93A		1.9 1.6		dB dB
G _{UM}	Maximum Unilateral Power Gain	I _C = 30 mA V _{CE} = 8 V f = 800 MHz f = 500 MHz for BFR93 f = 800 MHz for BFR93A		17 14		dB dB
d _{IM3}	Intermodulation Distortion	I _C = 30 mA V _{CE} = 8 V f = 800 MHz R _L = 75 Ω V _O = 425 mV f = 500 MHz for BFR93 f = 800 MHz for BFR93A		-60 -50		dB dB

* Pulsed: Pulse duration = 300 μs, duty cycle ≤ 2%

SOT-23 MECHANICAL DATA

DIM.	mm			mils		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	0.85		1.1	33.4		43.3
B	0.65		0.95	25.6		37.4
C	1.20		1.4	47.2		55.1
D	2.80		3	110.2		118
E	0.95		1.05	37.4		41.3
F	1.9		2.05	74.8		80.7
G	2.1		2.5	82.6		98.4
H	0.38		0.48	14.9		18.8
L	0.3		0.6	11.8		23.6
M	0		0.1	0		3.9
N	0.3		0.65	11.8		25.6
O	0.09		0.17	3.5		6.7



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