

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CE0}	12	Vdc
Collector-Base Voltage	V_{CBO}	15	Vdc
Emitter-Base Voltage	V_{EBO}	2.0	Vdc
Collector Current — Continuous	I_C	25	mAdc

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Device Dissipation FR-5 Board,* $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	225	mW
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	556	$^\circ\text{C/W}$
Total Device Dissipation Alumina Substrate,** $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	300	mW
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	417	$^\circ\text{C/W}$
Junction and Storage Temperature	T_J, T_{stg}	-55 to +150	$^\circ\text{C}$

*FR-5 = 1.0 x 0.75 x 0.062 in.

**Alumina = 0.4 x 0.3 x 0.024 in. 99.5% alumina.

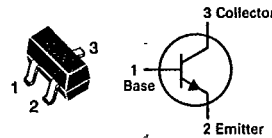
DEVICE MARKING

BFR93L = R1

MOTOROLA SC XSTRS/R F

BFR93L

T-31-15

CASE 318-03, STYLE 6
SOT-23 (TO-236AB)

RF TRANSISTOR

NPN SILICON

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

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector-Emitter Breakdown Voltage ($I_C = 10\text{ mA}$)	$V_{(BR)CEO}$	12	—	Vdc
Collector-Base Breakdown Voltage ($I_C = 10\text{ }\mu\text{A}$)	$V_{(BR)CBO}$	15	—	Vdc
Emitter-Base Breakdown Voltage ($I_E = 100\text{ }\mu\text{A}$)	$V_{(BR)EBO}$	2.0	—	Vdc
Collector Cutoff Current ($V_{CE} = 10\text{ V}$)	I_{CEO}	—	50	nA
Collector Cutoff Current ($V_{CB} = 10\text{ V}$)	I_{CBO}	—	50	nA
Emitter Cutoff Current ($V_{EB} = 1.0\text{ V}$)	I_{EBO}	—	10	nA
ON CHARACTERISTICS				
DC Current Gain ($I_C = 1.0\text{ mA}, V_{CE} = 5.0\text{ V}$) ($I_C = 30\text{ mA}, V_{CE} = 5.0\text{ V}$)	h_{FE}	25 25	—	—
Collector-Emitter Saturation Voltage ($I_C = 35\text{ mA}, I_B = 7.0\text{ mA}$)	$V_{CE(sat)}$	—	0.5	Vdc
Base-Emitter Saturation Voltage ($I_C = 35\text{ mA}, I_B = 7.0\text{ mA}$)	$V_{BE(sat)}$	—	1.2	Vdc
SMALL-SIGNAL CHARACTERISTICS				
Current-Gain — Bandwidth Product ($I_C = 30\text{ mA}, V_{CE} = 5.0\text{ V}, f = 500\text{ MHz}$)	f_T	4.5	—	GHz
Noise Figure ($V_{CE} = 5.0\text{ V}, I_C = 2.0\text{ mA}, R_S = 50\text{ }\Omega, f = 30\text{ MHz}$)	NF	—	3.0	dB