

## BFR93A (NPN)

### ● Features

- 1.High transition frequency.(Typ. $f_T=1.5\text{GHz}$ )
- 2.Small  $r_{bb}$  and high gain.(Typ.4ps)
- 3.Small NF.
- 4.We declare that the material of product compliance with RoHS requirements.

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

Parameter	Symbol	Value	Unit
Collector-Base Voltage	$V_{CBO}$	20	V
Collector-Emitter Voltage	$V_{CEO}$	11	V
Emitter-base voltage	$V_{EBO}$	3	V
Collector Current	$I_C$	50	mA
Collector power dissipation	$P_C$	0.2	W
Junction temperature	$T_j$	150	$^\circ\text{C}$
Storage temperature	$T_{stg}$	-55~+150	$^\circ\text{C}$



### DEVICE MARKING

BFR93A=RK

### ELECTRICAL CHARACTERISTICS( $T_A = 25^\circ\text{C}$ )

Parameter	Symbol	Min.	Typ	Max.	Unit	Conditions
Collector-base breakdown voltage	$BV_{CBO}$	20	-	-	V	$I_C=10\mu\text{A}$
Collector-emitter breakdown voltage	$BV_{CEO}$	11	-	-	V	$I_C=1\text{mA}$
Emitter-base breakdown voltage	$BV_{EBO}$	3	-	-	V	$I_E=10\mu\text{A}$
Collector cutoff current	$I_{CBO}$	-	-	0.5	$\mu\text{A}$	$V_{CB}=10\text{V}$
Emitter cutoff current	$I_{EBO}$	-	-	0.5	$\mu\text{A}$	$V_{EB}=2\text{V}$
Collector-emitter saturation voltage	$V_{CE(sat)}$	-	-	0.5	V	$I_C/I_B=10\text{mA}/5\text{mA}$
DC current transfer ratio	$h_{FE}$	56	-	120	-	$V_{CE}/I_C=10\text{V}/5\text{mA}$
Transition frequency	$f_T$	1.4	3.2	-	GHz	$V_{CE}=10\text{V}$ , $I_E=-10\text{mA}$ , $f=500\text{MHz}$
Output capacitance	$C_{ob}$	-	0.8	1.5	pF	$V_{CB}=10\text{V}$ , $I_E=0\text{A}$ , $f=1\text{MHz}$
Collector-base time constant	$r_{bb}$ Cc	-	4	12	ps	$V_{CB}=10\text{V}$ , $I_C=10\text{mA}$ , $f=31.8\text{MHz}$
Noise factor	NF	-	3.5	-	dB	$V_{CE}=6\text{V}$ , $I_C=2\text{mA}$ , $f=500\text{MHz}$ , $R_g=50\Omega$