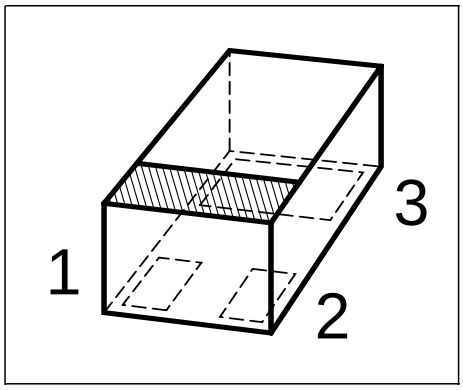
NPN Silicon RF Transistor

Preliminary data

- For low noise, high-gain broadband amplifiers at collector currents from 1 mA to 20 mA
- f_T = 9 GHz
  F = 1.0 dB at 1 GHz



ESD: **E**lectro**s**tatic **d**ischarge sensitive device, observe handling precaution!

Type	Marking	Pin Configuration			Package
BFR949L3	RK	1 = B	2 = E	3 = C	TSLP-3-1

Maximum Ratings

Parameter	Symbol	Value	Unit
Collector-emitter voltage	V_{CEO}	10	V
Collector-emitter voltage	V_{CES}	20	
Collector-base voltage	V_{CBO}	20	
Emitter-base voltage	V_{EBO}	1.5	
Collector current	I_C	35	mA
Base current	I_B	4	
Total power dissipation $T_S \leq 100°C$ [1)]	P_{tot}	250	mW
Junction temperature	T_j	150	°C
Ambient temperature	T_A	-65 ... 150	
Storage temperature	T_{stg}	-65 ... 150	

Thermal Resistance

Junction - soldering point[2)]	R_{thJS}	≤ tbd	K/W

[1] T_S is measured on the collector lead at the soldering point to the pcb

[2] For calculation of R_{thJA} please refer to Application Note Thermal Resistance

Electrical Characteristics at T_A = 25°C, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
DC Characteristics					
Collector-emitter breakdown voltage I_C = 1 mA, I_B = 0	$V_{(BR)CEO}$	10	-	-	V
Collector-emitter cutoff current V_{CE} = 20 V, V_{BE} = 0	I_{CES}	-	-	100	µA
Collector-base cutoff current V_{CB} = 10 V, I_E = 0	I_{CBO}	-	-	100	nA
Emitter-base cutoff current V_{EB} = 1 V, I_C = 0	I_{EBO}	-	-	0.1	µA
DC current gain I_C = 5 mA, V_{CE} = 6 V	h_{FE}	100	140	200	-

Electrical Characteristics at T_A = 25°C, unless otherwise specified.

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
AC characteristics (verified by random sampling)					
Transition frequency I_C = 15 mA, V_{CE} = 6 V, f = 1 GHz	f_T	7	9	-	GHz
Collector-base capacitance V_{CB} = 10 V, f = 1MHz	C_{cb}	-	0.25	-	pF
Collector-emitter capacitance V_{CE} = 10 V, f = 1MHz	C_{ce}	-	0.15	-	
Emitter-base capacitance V_{EB} = 0.5 V, f = 1MHz	C_{eb}	-	0.7	-	
Noise figure I_C = 5 mA, V_{CE} = 6 V, Z_S = Z_{Sopt} , f = 1 GHz I_C = 3 mA, V_{CE} = 8 V, Z_S = Z_{Sopt} , f = 1.8 GHz	F	 - -	 1 1.5	 2.5 -	dB
Power gain, maximum stable [1)] I_C = 10 mA, V_{CE} = 8 V, Z_S = Z_{Sopt}, Z_L = Z_{Lopt} , f = 900 MHz	G_{ms}	-	21.5	-	
Power gain, maximum available [2)] I_C = 10 mA, V_{CE} = 8 V, Z_S = Z_{Sopt}, Z_L = Z_{Lopt} , f = 1.8 GHz	G_{ma}	-	15.5	-	
Transducer gain I_C = 15 mA, V_{CE} = 6 V, Z_S = Z_L = 50Ω , f = 1 GHz I_C = 10 mA, V_{CE} = 8 V, Z_S = Z_L = 50Ω , f = 1.8 GHz	$\lvert S_{21e}\rvert^2$	 14 -	 17 12	 - -	

[1] $G_{ms} = |S_{21} / S_{12}|$

[2] $G_{ma} = |S_{21} / S_{12}| \, (k-(k^2-1)^{1/2})$