

BFR183

Low Noise Silicon Bipolar RF Transistor

- For low noise, high-gain broadband amplifiers at collector currents from 2 mA to 30 mA
- $f_{\rm T}$ = 8 GHz, $NF_{\rm min}$ = 0.9 dB at 900 MHz
- Pb-free (RoHS compliant) package
- Qualification report according to AEC-Q101 available





ESD (Electrostatic discharge) sensitive device, observe handling precaution!

Туре	Marking	Pin Configuration			Package
BFR183	RHs	1=B	2=E	3=C	SOT23

Maximum Ratings at T_A = 25 °C, unless otherwise specified

Parameter	Symbol	Value	Unit	
Collector-emitter voltage	V _{CEO}	12	V	
Collector-emitter voltage	V _{CES}	20		
Collector-base voltage	V _{CBO}	20		
Emitter-base voltage	V _{EBO}	2		
Collector current	I _C	65	mA	
Base current	/ _B	5		
Total power dissipation ¹⁾	P _{tot}	450	mW	
<i>T</i> _S ≤ 60 °C				
Junction temperature	TJ	150	°C	
Storage temperature	T _{Stg}	-55 150		

Thermal Resistance

Parameter	Symbol	Value	Unit
Junction - soldering point ²⁾	R _{thJS}	200	K/W

 ${}^{1}\mathcal{T}_{S}$ is measured on the collector lead at the soldering point to the pcb

²For the definition of R_{thJS} please refer to Application Note AN077 (Thermal Resistance Calculation)



Parameter	Symbol	Values			Unit
		min.	typ.	max.]
DC Characteristics				•	
Collector-emitter breakdown voltage	V _{(BR)CEO}	12	-	-	V
<i>I</i> _C = 1 mA, <i>I</i> _B = 0					
Collector-emitter cutoff current	I _{CES}	-	-	100	μA
$V_{\rm CE}$ = 20 V, $V_{\rm BE}$ = 0					
Collector-base cutoff current	I _{CBO}	-	-	100	nA
$V_{\rm CB}$ = 10 V, $I_{\rm E}$ = 0					
Emitter-base cutoff current	I _{EBO}	-	-	1	μA
$V_{\rm EB}$ = 1 V, $I_{\rm C}$ = 0					
DC current gain	h _{FE}	70	100	140	-
$I_{\rm C}$ = 15 mA, $V_{\rm CE}$ = 8 V, pulse measured					

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



Parameter	Symbol	Values			Unit
		min.	typ.	max.	
AC Characteristics (verified by random samplin	g)	r	T	1	
Transition frequency	f _T	6	8	-	GHz
<i>I</i> _C = 25 mA, <i>V</i> _{CE} = 8 V, <i>f</i> = 500 MHz					
Collector-base capacitance	C _{cb}	-	0.37	0.57	pF
$V_{\rm CB}$ = 10 V, f = 1 MHz, $V_{\rm BE}$ = 0 ,					
emitter grounded					
Collector emitter capacitance	C _{ce}	-	0.2	-	
$V_{\rm CE}$ = 10 V, f = 1 MHz, $V_{\rm BE}$ = 0,					
base grounded					
Emitter-base capacitance	C _{eb}	-	1.1	-]
$V_{\rm EB} = 0.5 \text{ V}, f = 1 \text{ MHz}, V_{\rm CB} = 0$,					
collector grounded					
Minimum noise figure	NF _{min}				dB
$I_{\rm C}$ = 5 mA, $V_{\rm CE}$ = 8 V, $Z_{\rm S}$ = $Z_{\rm Sopt}$,					
<i>f</i> = 900 MHz		-	0.9	-	
<i>f</i> = 1.8 GHz		-	1.4	-	
Power gain, maximum stable ¹⁾	G _{ms}	-	17.5	-	dB
$I_{\rm C}$ = 15 mA, $V_{\rm CE}$ = 8 V, $Z_{\rm S}$ = $Z_{\rm Sopt}$, $Z_{\rm L}$ = $Z_{\rm Lopt}$,					
<i>f</i> = 900 MHz					
Power gain, maximum available ¹⁾	G _{ma}	-	11.5	-	dB
$I_{\rm C} = 15 \text{ mA}, V_{\rm CE} = 8 \text{ V}, Z_{\rm S} = Z_{\rm Sopt}, Z_{\rm L} = Z_{\rm Lopt},$					
f = 1.8 GHz					
Transducer gain	S _{21e} ²				dB
$I_{\rm C}$ = 15 mA, $V_{\rm CE}$ = 8 V, $Z_{\rm S}$ = $Z_{\rm L}$ = 50 Ω ,					
f = 900 MHz		-	14.5	-	
<i>f</i> = 1.8 MHz		-	9	-	

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

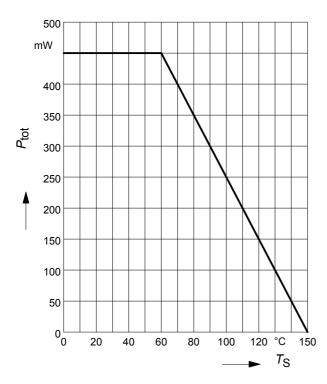
 ${}^{1}G_{\rm ma} = |S_{21\rm e} \ / \ S_{12\rm e}| \ (k - (k^2 - 1)^{1/2}), \ G_{\rm ms} = |S_{21} \ / \ S_{12}|$



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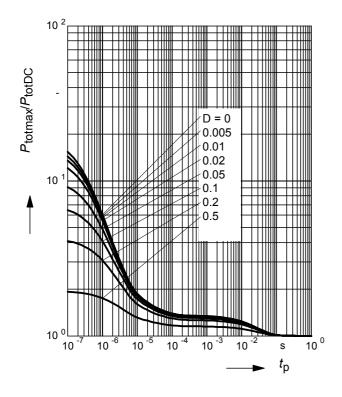
Total power dissipation $P_{tot} = f(T_S)$

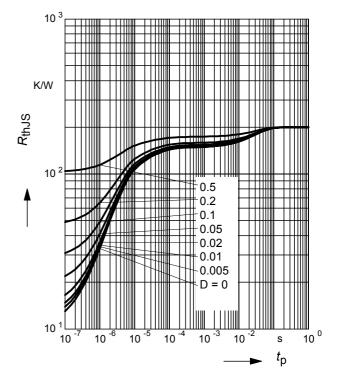
Permissible Pulse Load $R_{\text{thJS}} = f(t_p)$



Permissible Pulse Load

 $P_{\text{totmax}}/P_{\text{totDC}} = f(t_{p})$



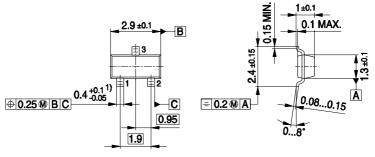




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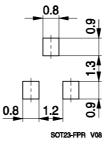




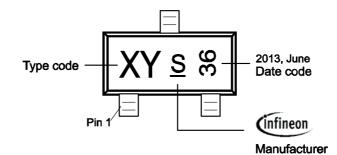
1) Lead width can be 0.6 max. in dambar area

SOT23-PO V08

Foot Print

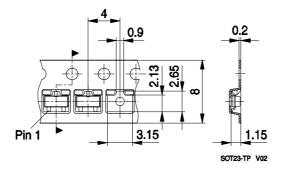


Marking Layout



Standard Packing

Reel o 180 mm: 3.000 Pieces / Reel Reel o 330 mm = 10.000 Pieces / Reel







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