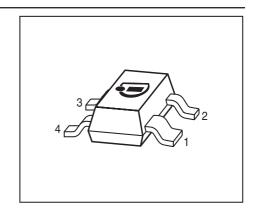


NPN Silicon RF Transistor

- For low noise, high-gain amplifiers up to 2 GHz
- For linear broadband amplifiers
- f_T = 8 GHz, NF_{min} = 1 dB at 900 MHz
- Pb-free (RoHS compliant) package





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

Туре	Marking	Pin Configuration				Package		
BFP193	RCs	1 = C	2 = E	3 = B	4 = E	1	-	SOT143

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

Parameter	Symbol	Value	Unit
Collector-emitter voltage	$V_{\sf CEO}$	12	V
Collector-emitter voltage	V_{CES}	20	
Collector-base voltage	V_{CBO}	20	
Emitter-base voltage	V_{EBO}	2	
Collector current	I _C	80	mA
Base current	l _B	10	
Total power dissipation ¹⁾	P _{tot}	580	mW
<i>T</i> _S ≤ 72°C			
Junction temperature	T_{J}	150	°C
Ambient temperature	T_{A}	-65 150	
Storage temperature	T_{Stq}	-65 150	

Thermal Resistance

Parameter	Symbol	Value	Unit
Junction - soldering point ²⁾	R _{thJS}	≤ 135	K/W

1

 $^{{}^{1}}T_{\mbox{S}}$ is measured on the collector lead at the soldering point to the pcb

 $^{^2}$ For calculation of R_{thJA} please refer to Application Note AN077 (Thermal Resistance Calculation)



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

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
DC Characteristics	•			•	
Collector-emitter breakdown voltage	V _{(BR)CEO}	12	-	_	V
$I_{\rm C}$ = 1 mA, $I_{\rm B}$ = 0	, ,				
Collector-emitter cutoff current	I _{CES}	-	-	100	μΑ
$V_{CE} = 20 \text{ V}, V_{BE} = 0$					
Collector-base cutoff current	I _{CBO}	-	-	100	nA
$V_{\rm CB} = 10 \text{ V}, I_{\rm E} = 0$					
Emitter-base cutoff current	I _{EBO}	-	_	1	μΑ
$V_{\rm EB}$ = 1 V, $I_{\rm C}$ = 0					
DC current gain	h _{FE}	70	100	140	-
$I_{\rm C}$ = 30 mA, $V_{\rm CE}$ = 8 V, pulse measured					

2



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

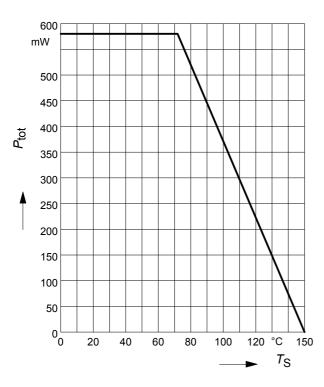
Parameter Parameter $I_A = 25 \text{ C}$, unles	Symbol		Unit		
		min.	typ.	max.	
AC Characteristics (verified by random sample	ing)				·
Transition frequency	f _T	6	8	-	GHz
$I_{\rm C}$ = 50 mA, $V_{\rm CE}$ = 8 V, f = 500 MHz					
Collector-base capacitance	C _{cb}	-	0.59	0.9	pF
$V_{\text{CB}} = 10 \text{ V}, f = 1 \text{ MHz}, V_{\text{BE}} = 0$,					
emitter grounded					
Collector emitter capacitance	C _{ce}	-	0.28	_	
$V_{CE} = 10 \text{ V}, f = 1 \text{ MHz}, V_{BE} = 0$,					
base grounded					
Emitter-base capacitance	C _{eb}	-	2.25	-	
$V_{\text{EB}} = 0.5 \text{ V}, f = 1 \text{ MHz}, V_{\text{CB}} = 0$,					
collector grounded					
Minimum noise figure	NF _{min}				dB
$I_{\rm C}$ = 10 mA, $V_{\rm CE}$ = 8 V, $Z_{\rm S}$ = $Z_{\rm Sopt}$,					
f = 900 MHz		-	1	-	
$I_{\rm C}$ = 10 mA, $V_{\rm CE}$ = 8 V, $Z_{\rm S}$ = $Z_{\rm Sopt}$,					
f = 1.8 GHz		-	1.6	-	
Power gain, maximum available ¹⁾	G _{ma}				
$I_{\rm C}$ = 30 mA, $V_{\rm CE}$ = 8 V, $Z_{\rm S}$ = $Z_{\rm Sopt}$,					
$Z_{L} = Z_{Lopt}$, $f = 900 \text{ MHz}$		-	18	_	
$I_{\rm C} = 30 \text{ mA}, V_{\rm CE} = 8 \text{ V}, Z_{\rm S} = Z_{\rm Sopt}$,					
$Z_{L} = Z_{Lopt}$, $f = 1.8 \text{ GHz}$		-	12	-	
Transducer gain	$ S_{21e} ^2$				dB
$I_{\rm C}$ = 30 mA, $V_{\rm CE}$ = 8 V, $Z_{\rm S}$ = $Z_{\rm L}$ = 50 Ω ,					
f = 900 MHz		_	14.5	-	
$I_{\rm C}$ = 30 mA, $V_{\rm CE}$ = 8 V, $Z_{\rm S}$ = $Z_{\rm L}$ = 50 Ω ,					
f = 1.8 GHz		_	8.5	_	

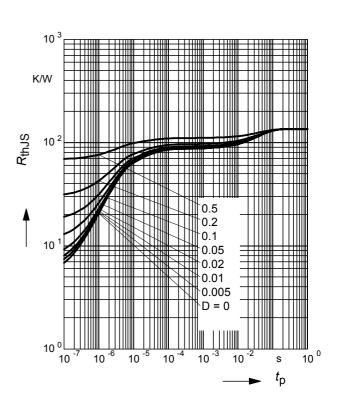
 $^{{}^{1}}G_{\text{ma}} = |S_{21} / S_{12}| (k-(k^{2}-1)^{1/2})$



Total power dissipation $P_{\text{tot}} = f(T_{\text{S}})$

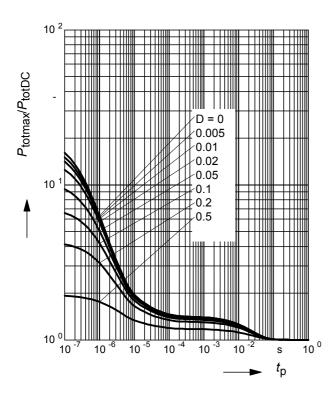
Permissible Pulse Load $R_{thJS} = f(t_p)$





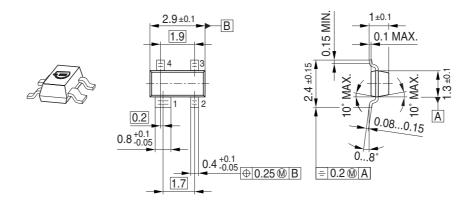
Permissible Pulse Load

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

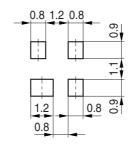




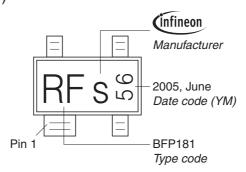
Package Outline



Foot Print

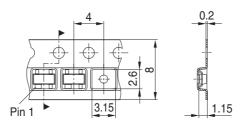


Marking Layout (Example)



Standard Packing

Reel ø180 mm = 3.000 Pieces/Reel Reel ø330 mm = 10.000 Pieces/Reel





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