

BFG196

NPN Silicon RF Transistor*

- For low noise, low distortion broadband amplifiers in antenna and telecommunications systems up to 1.5 GHz at collector currents from 20 mA to 80 mA
- Power amplifier for DECT and PCN systems
- *f*_T = 7.5 GHz, *F* = 1.3 dB at 900 MHz
- Pb-free (RoHS compliant) package¹⁾
- Qualified according AEC Q101
- * Short term description



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

Туре	Marking	Pin Configuration				Package		
BFG196	BFG196	1 = E	2 = B	3 = E	4 = C	-	-	SOT223

Maximum Ratings				
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	150	mA	
Base current	/ _B	15		
Total power dissipation ²⁾	P _{tot}	800	mW	
$T_{\rm S} \le 90^{\circ}{\rm C}$				
Junction temperature	T _i	150	°C	
Ambient temperature	T _A	-65 150		
Storage temperature	T _{stq}	-65 150		

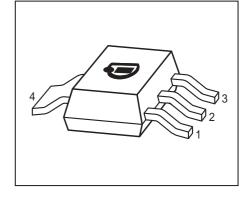
Thermal Resistance

Parameter	Symbol	Value	Unit
Junction - soldering point ³⁾	R _{thJS}	≤ 75	K/W

¹Pb-containing package may be available upon special request

 $^2 T_{\mbox{S}}$ is measured on the collector lead at the soldering point to the pcb

³For calculation of R_{thJA} please refer to Application Note Thermal Resistance





Parameter	Symbol	Values			Unit
		min.	typ.	max.	
DC Characteristics					
Collector-emitter breakdown voltage	V _{(BR)CEO}	12	-	-	V
$I_{\rm C} = 1 {\rm mA}, I_{\rm B} = 0$					
Collector-emitter cutoff current	I _{CES}	-	-	100	μA
$V_{\rm CE} = 20 \text{ V}, \ V_{\rm BE} = 0$					
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	μA
$V_{\rm EB} = 1 \text{V}, I_{\rm C} = 0$					
DC current gain-	h _{FE}	70	100	140	-
$I_{\rm C}$ = 50 mA, $V_{\rm CE}$ = 8 V, pulse measured					

Electrical Characteristics at $T_A = 25^{\circ}$ C, unless otherwise specified



Parameter	Symbol	Values			Unit
		min.	typ.	max.	
AC Characteristics (verified by random sam	pling)	1	1	1	1
Transition frequency	f _T	5	7.5	-	GHz
$I_{\rm C}$ = 70 mA, $V_{\rm CE}$ = 8 V, f = 500 MHz					
Collector-base capacitance	C _{cb}	-	0.85	1.3	pF
$V_{CB} = 10 \text{ V}, f = 1 \text{ MHz}, V_{BE} = 0$,					
emitter grounded					
Collector emitter capacitance	C _{ce}	-	0.45	-	
$V_{CE} = 10 \text{ V}, f = 1 \text{ MHz}, V_{BE} = 0$,					
base grounded					
Emitter-base capacitance	C _{eb}	-	4.2	-]
$V_{\rm EB} = 0.5 \text{ V}, \ f = 1 \text{ MHz}, \ V_{\rm CB} = 0 ,$					
collector grounded					
Noise figure	F				dB
$I_{\rm C} = 20 \text{ mA}, V_{\rm CE} = 8 \text{ V}, Z_{\rm S} = Z_{\rm Sopt},$					
<i>f</i> = 900 MHz		-	1.3	-	
$I_{\rm C}$ = 20 mA, $V_{\rm CE}$ = 8 V, $Z_{\rm S}$ = $Z_{\rm Sopt}$,					
<i>f</i> = 1.8 GHz		-	2.3	-	
Power gain, maximum available ¹⁾	G _{ma}				1
$I_{\rm C}$ = 50 mA, $V_{\rm CE}$ = 8 V, $Z_{\rm S}$ = $Z_{\rm Sopt}$,					
$Z_{\rm L} = Z_{\rm Lopt}$, $f = 900 {\rm MHz}$		-	14.5	-	
$I_{\rm C}$ = 50 mA, $V_{\rm CE}$ = 8 V, $Z_{\rm S}$ = $Z_{\rm Sopt}$,					
$Z_{L} = Z_{Lopt}$, $f = 1.8 \text{ GHz}$		-	9	-	
Transducer gain	S _{21e} ²				dB
$I_{\rm C}$ = 50 mA, $V_{\rm CE}$ = 8 V, $Z_{\rm S}$ = $Z_{\rm L}$ = 50 Ω ,					
<i>f</i> = 900 MHz		-	12	-	
$I_{\rm C} = 50 \text{ mA}, \ V_{\rm CE} = 8 \text{ V}, \ Z_{\rm S} = Z_{\rm L} = 50 \Omega$,					
<i>f</i> = 1.8 GHz		-	6.5	-	

Electrical Characteristics at $T_A = 25^{\circ}$ C, unless otherwise specified

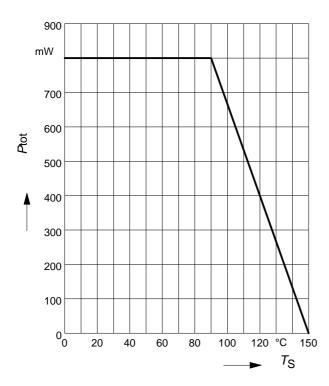
 ${}^{1}G_{ma} = |S_{21} / S_{12}| (k - (k^{2} - 1)^{1/2})$



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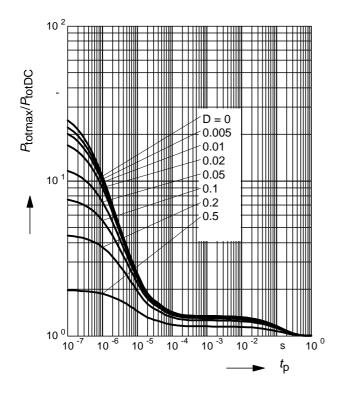
Total power dissipation $P_{tot} = f(T_S)$

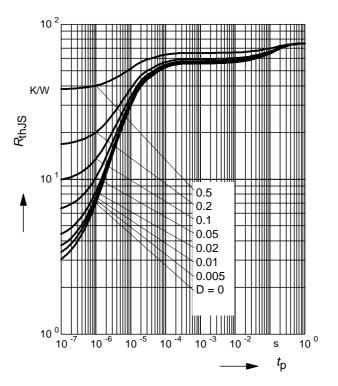
Permissible Pulse Load $R_{\text{thJS}} = f(t_{\text{p}})$



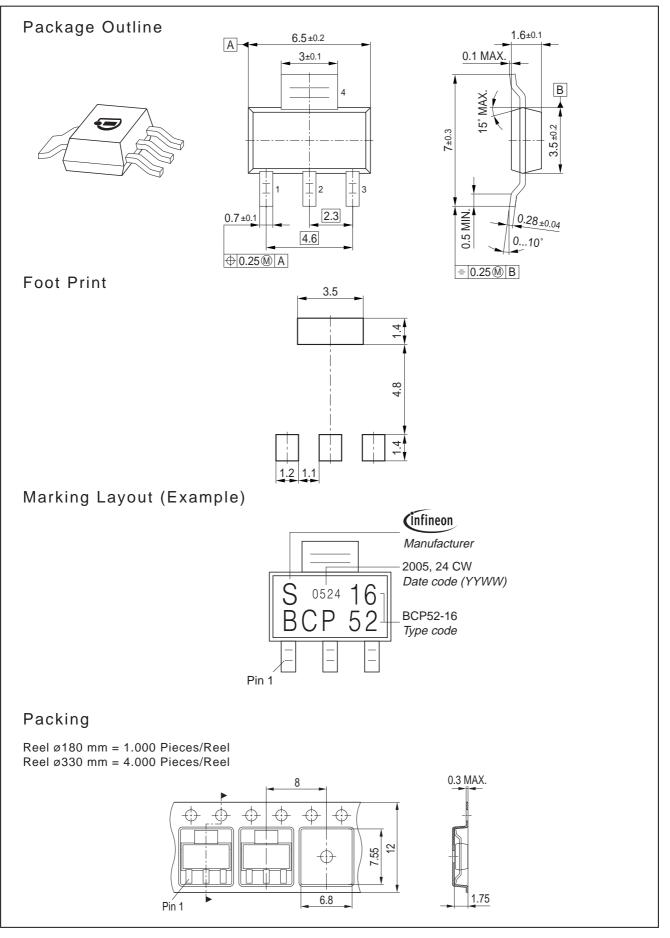
Permissible Pulse Load

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











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