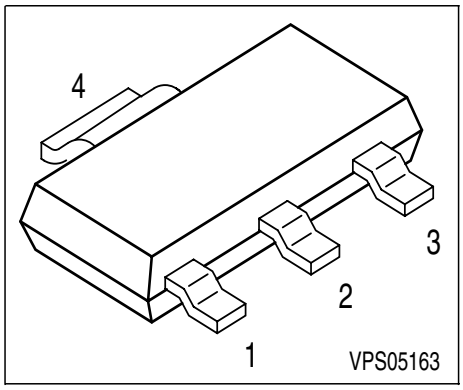
NPN Silicon RF Transistor

- For low noise, low distortion broadband amplifiers in antenna and telecommunication systems up to 1.5 GHz at collector currents from 10 mA to 70 mA



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

Type	Marking	Pin Configuration				Package
BFG 19S	BFG19S	1 = E	2 = B	3 = E	4 = C	SOT-223

Maximum Ratings

Parameter	Symbol	Value	Unit
Collector-emitter voltage	V_{CEO}	15	V
Collector-emitter voltage	V_{CES}	20	
Collector-base voltage	V_{CBO}	20	
Emitter-base voltage	V_{EBO}	3	
Collector current	I_C	100	mA
Base current	I_B	12	
Total power dissipation, $T_S \leq 75$ °C [1)]	P_{tot}	1	W
Junction temperature	T_j	150	°C
Ambient temperature	T_A	-65 ... 150	
Storage temperature	T_{stg}	-65 ... 150	

Thermal Resistance

Junction - soldering point	R_{thJS}	≤ 75	K/W

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

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	$V_{(BR)CEO}$	15	-	-	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} = 2 V, I_C = 0	I_{EBO}	-	-	10	µA
DC current gain I_C = 70 mA, V_{CE} = 8 V	h_{FE}	40	100	220	-

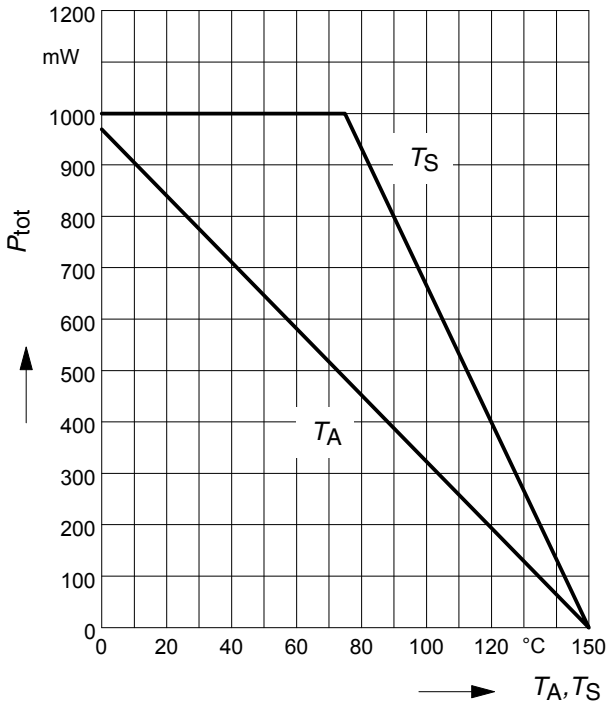
Electrical Characteristics at T_A = 25°C, unless otherwise specified.

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
AC characteristics (verified by random sampling)					
Transition frequency I_C = 70 mA, V_{CE} = 8 V, f = 500 MHz	f_T	4	5.5	-	GHz
Collector-base capacitance V_{CB} = 10 V, f = 1 MHz	C_{cb}	-	0.85	1.4	pF
Collector-emitter capacitance V_{CE} = 10 V, f = 1 MHz	C_{ce}	-	0.4	-	
Emitter-base capacitance V_{EB} = 0.5 V, f = 1 MHz	C_{eb}	-	4.6	-	
Noise figure I_C = 20 mA, V_{CE} = 8 V, Z_S = Z_{Sopt} , f = 900 MHz f = 1.8 GHz	F	 - -	 2.5 4	 - -	dB
Power gain, maximum available [F)] I_C = 70 mA, V_{CE} = 8 V, Z_S = Z_{Sopt}, Z_L = Z_{Lopt} , f = 900 MHz f = 1.8 GHz	G_{ma}	 - -	 13.5 8	 - -	
Transducer gain I_C = 30 mA, V_{CE} = 8 V, Z_S = Z_L = 50Ω , f = 900 MHz f = 1.8 GHz	$\lvert S_{21e}\rvert^2$	 - -	 11 5	 - -	
Third order intercept point I_C = 70 mA, V_{CE} = 8 V, Z_S = Z_L = 50Ω , f = 900 MHz	IP_3	-	35	-	dBm

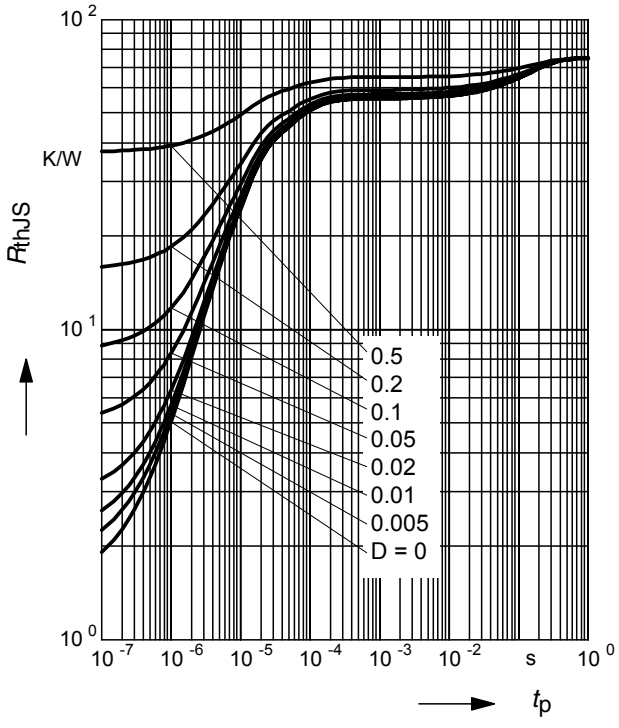
[1] $G_{ma} = |S_{21} / S_{12}| (k-(k^2-1)^{1/2})$

Total power dissipation $P_{tot} = f(T_A^*, T_S)$

* Package mounted on epoxy

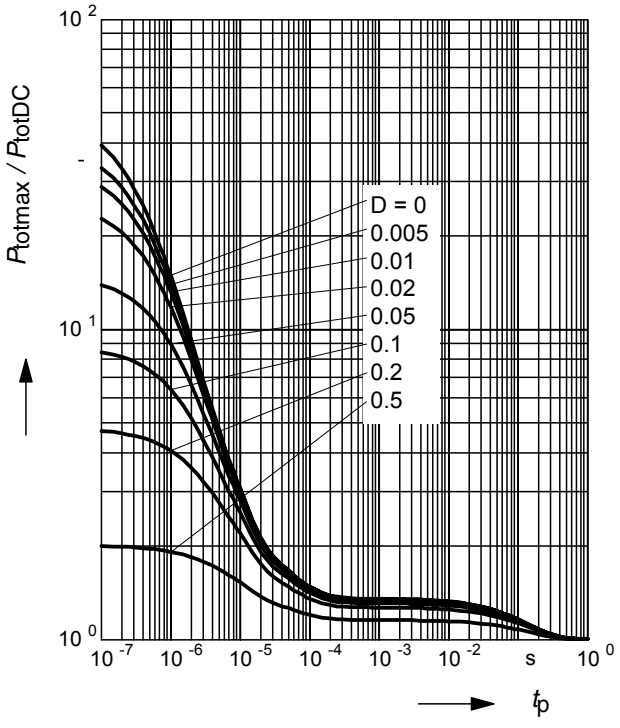


Permissible Pulse Load $R_{thJS} = f(t_p)$



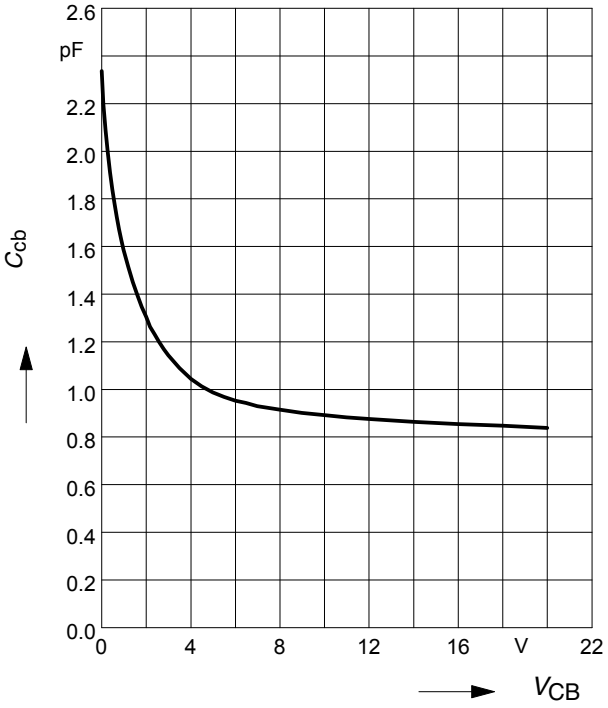
Permissible Pulse Load

$P_{totmax}/P_{totDC} = f(t_p)$



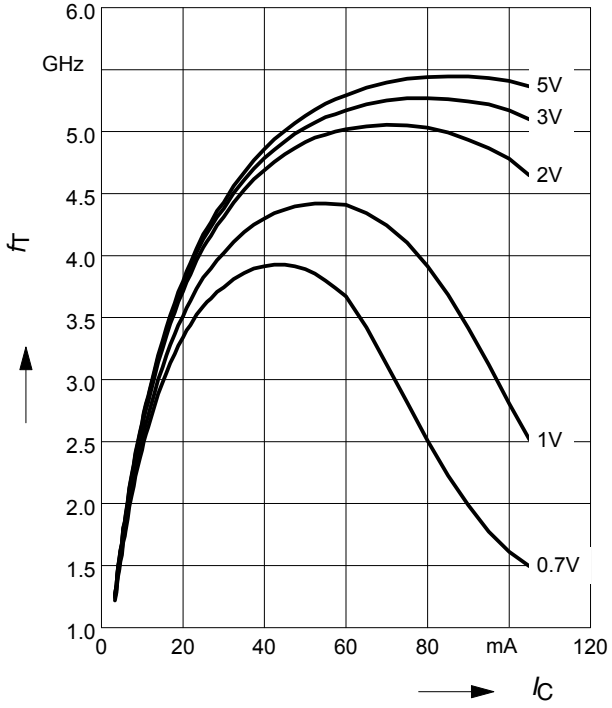
Collector-base capacitance $C_{cb} = f(V_{CB})$

f = 1MHz



Transition frequency $f_T = f(I_C)$

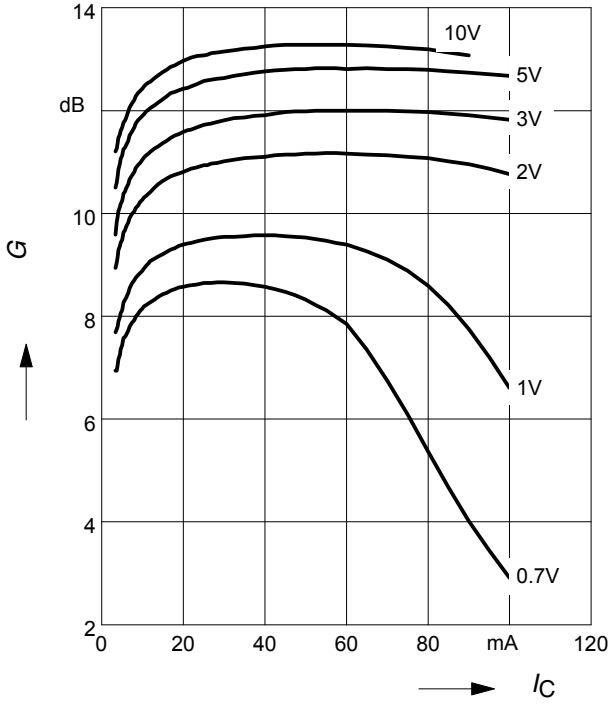
V_{CE} = Parameter



Power Gain G_{ma}, $G_{ms} = f(I_C)$

f = 0.9GHz

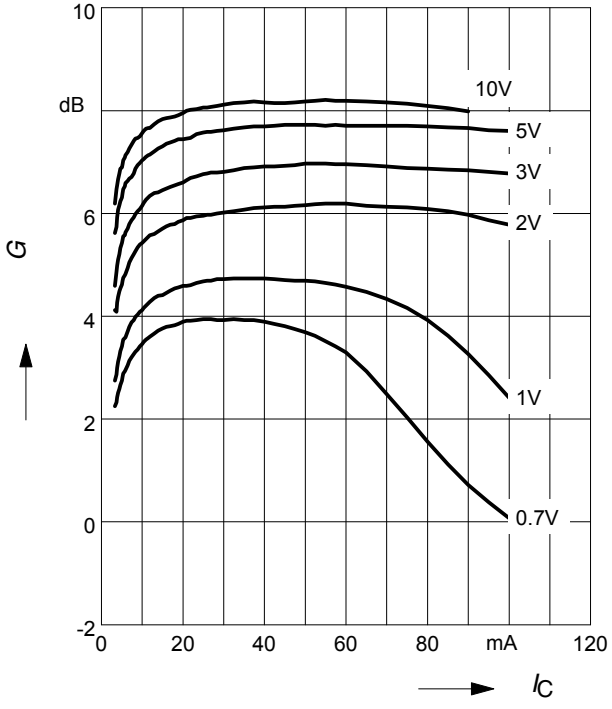
V_{CE} = Parameter



Power Gain G_{ma}, $G_{ms} = f(I_C)$

f = 1.8GHz

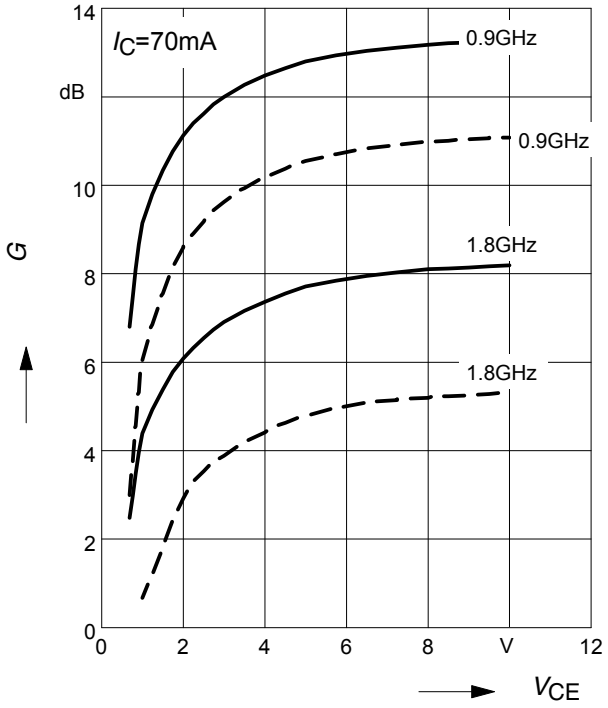
V_{CE} = Parameter



Power Gain G_{ma}, G_{ms} = $f(V_{CE})$:_____

$|S_{21}|^2$ = $f(V_{CE})$:---------

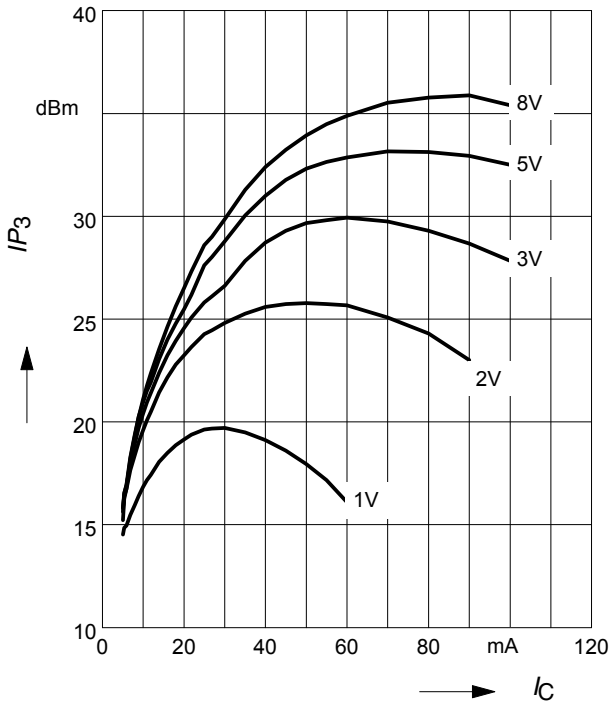
f = Parameter



Intermodulation Intercept Point IP_3=$f(I_C)$

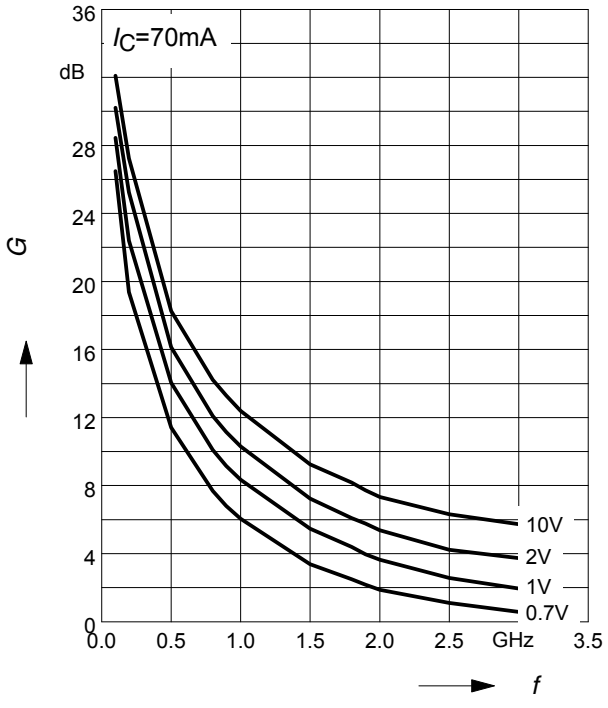
(3rd order, Output, Z_S=Z_L=50Ω)

V_{CE} = Parameter, f = 900MHz



Power Gain G_{ma}, G_{ms} = $f(f)$

V_{CE} = Parameter



Power Gain $|S_{21}|^2$= $f(f)$

V_{CE} = Parameter

