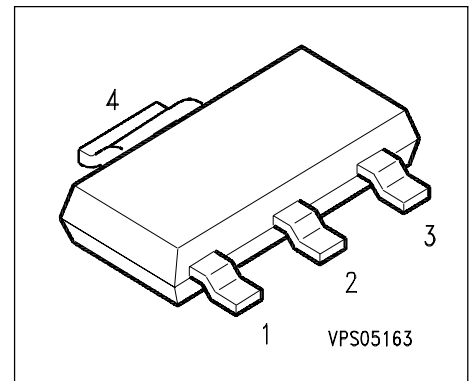


## NPN Silicon RF Transistor

- For low-distortion broadband output amplifier stages in antenna and telecommunications systems up to 2 GHz at collector currents from 120mA to 250mA
- Power amplifiers for DECT and PCN systems
- Integrated emitter ballast resistor
- $f_T = 5.5$  GHz



**ESD: Electrostatic discharge sensitive device, observe handling precaution!**

Type	Marking	Ordering Code	Pin Configuration				Package
BFG 235	BFG235	Q62702-F1432	1 = E	2 = B	3 = E	4 = C	SOT-223

### Maximum Ratings

Parameter	Symbol	Values	Unit
Collector-emitter voltage	$V_{CEO}$	15	V
Collector-emitter voltage	$V_{CES}$	25	
Collector-base voltage	$V_{CBO}$	25	
Emitter-base voltage	$V_{EBO}$	2	
Collector current	$I_C$	300	mA
Base current	$I_B$	40	
Total power dissipation $T_S \leq 80$ °C	$P_{tot}$	2000	mW
Junction temperature	$T_j$	150	°C
Ambient temperature	$T_A$	- 65 ... + 150	
Storage temperature	$T_{stg}$	- 65 ... + 150	

### Thermal Resistance

Junction - soldering point <sup>1)</sup>	$R_{thJS}$	$\leq 35$	K/W
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1)  $T_S$  is measured on the collector lead at the soldering point to the pcb.

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

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
<b>DC Characteristics</b>					
Collector-emitter breakdown voltage $I_C = 1 \text{ mA}, I_B = 0$	$V_{(BR)CEO}$	15	-	-	V
Collector-emitter cutoff current $V_{CE} = 25 \text{ V}, V_{BE} = 0$	$I_{CES}$	-	-	200	$\mu\text{A}$
Collector-base cutoff current $V_{CB} = 10 \text{ V}, I_E = 0$	$I_{CBO}$	-	-	100	nA
Emitter-base cutoff current $V_{EB} = 1 \text{ V}, I_C = 0$	$I_{EBO}$	-	-	2	$\mu\text{A}$
DC current gain $I_C = 200 \text{ mA}, V_{CE} = 5 \text{ V}$	$h_{FE}$	50	120	250	-

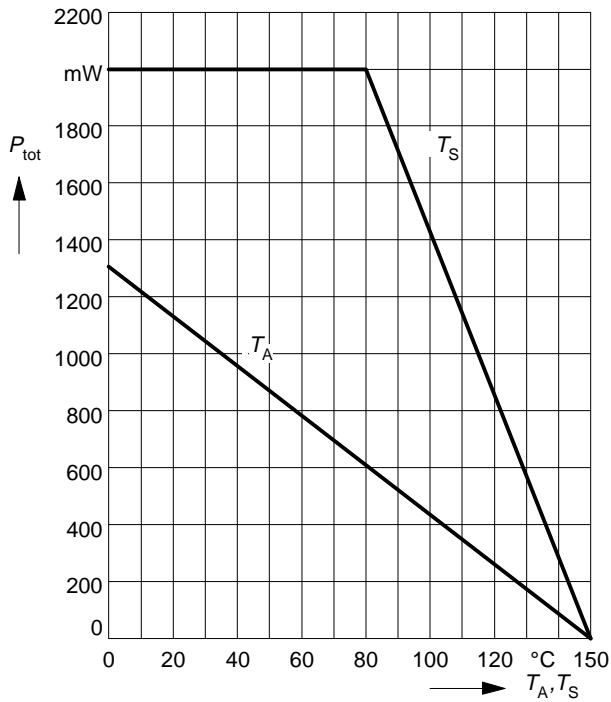
**Electrical Characteristics** at  $T_A = 25^\circ\text{C}$ , unless otherwise specified.

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
<b>AC Characteristics</b>					
Transition frequency $I_C = 200\text{ mA}, V_{CE} = 8\text{ V}, f = 200\text{ MHz}$	$f_T$	4	5.5	-	GHz
Collector-base capacitance $V_{CB} = 10\text{ V}, f = 1\text{ MHz}$	$C_{cb}$	-	2.6	3.6	pF
Collector-emitter capacitance $V_{CE} = 10\text{ V}, f = 1\text{ MHz}$	$C_{ce}$	-	1.5	-	
Emitter-base capacitance $V_{EB} = 0.5\text{ V}, f = 1\text{ MHz}$	$C_{eb}$	-	15	-	
Noise figure $I_C = 60\text{ mA}, V_{CE} = 8\text{ V}, f = 900\text{ MHz}$ $Z_S = Z_{Sopt}$	$F$	-	2.7	-	dB
Power gain <sup>2)</sup> $I_C = 200\text{ mA}, V_{CE} = 8\text{ V}, f = 900\text{ MHz}$ $Z_S = Z_{Sopt}, Z_L = Z_{Lopt}$	$G_{ma}$	-	12	-	
Transducer gain $I_C = 200\text{ mA}, V_{CE} = 8\text{ V}, f = 900\text{ MHz}$ $Z_S = Z_L = 50\ \Omega$	$ S_{21e} ^2$	-	6	-	
Third order intercept point $I_C = 200\text{ mA}, V_{CE} = 8\text{ V}, f = 900\text{ MHz}$ $Z_S = Z_L = 50\ \Omega$	$IP_3$	-	40	-	dBm

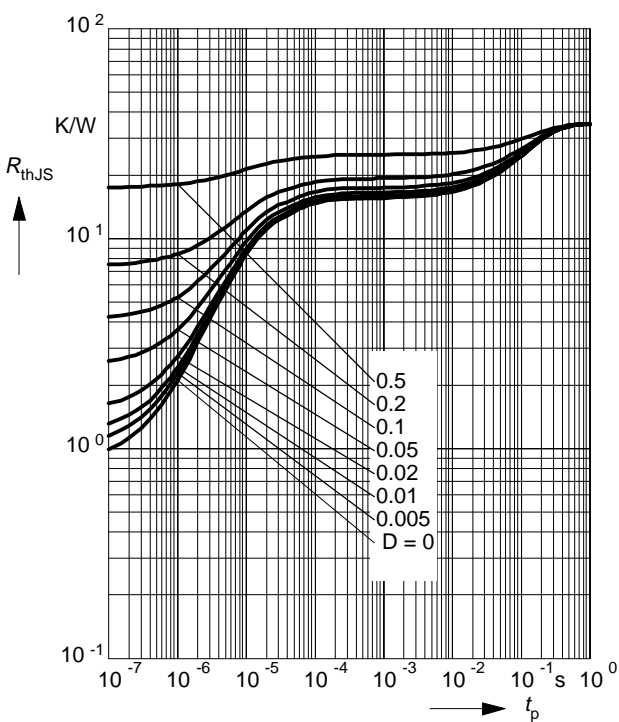
2)  $G_{ma} = |S_{21}/S_{12}| (k - (k^2 - 1)^{1/2})$

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

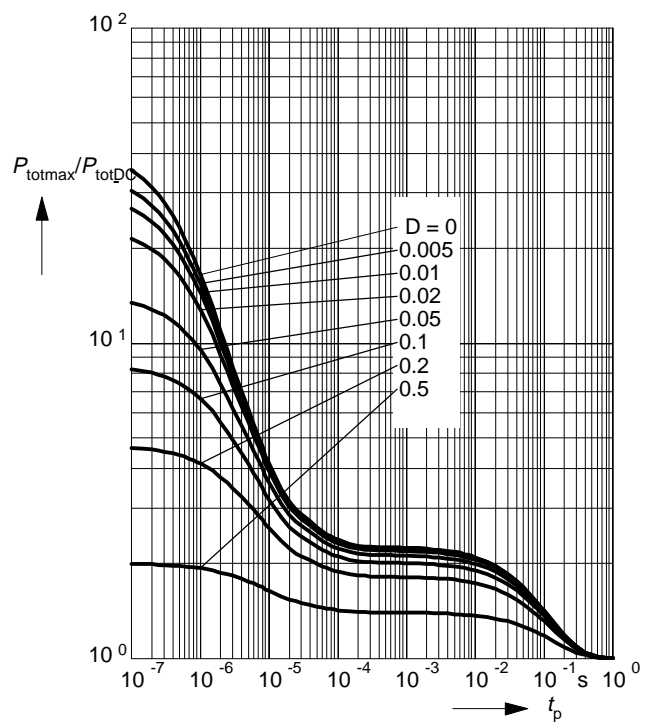
\* Package mounted on epoxy



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

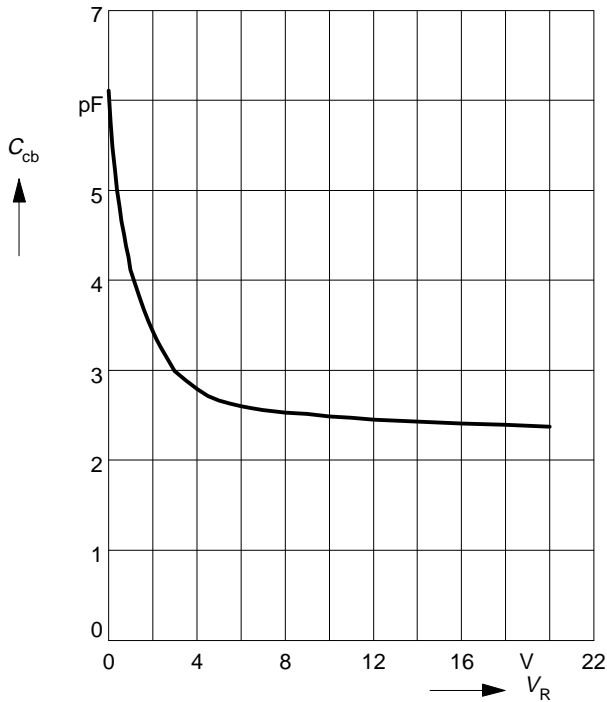


### Permissible Pulse Load $P_{totmax}/P_{totDC} = f(t_p)$



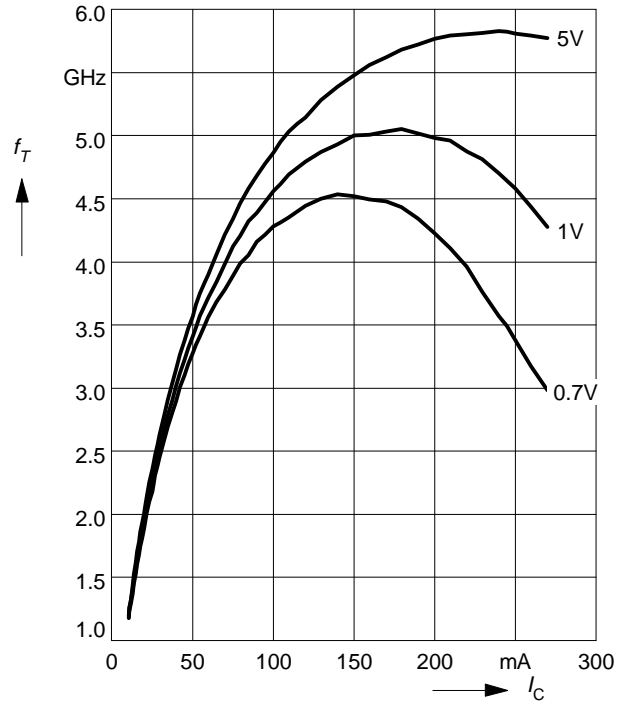
### Collector-base capacitance $C_{cb} = f(V_{CB})$

$V_{BE} = v_{be} = 0, f = 1\text{MHz}$



### Transition frequency $f_T = f(I_C)$

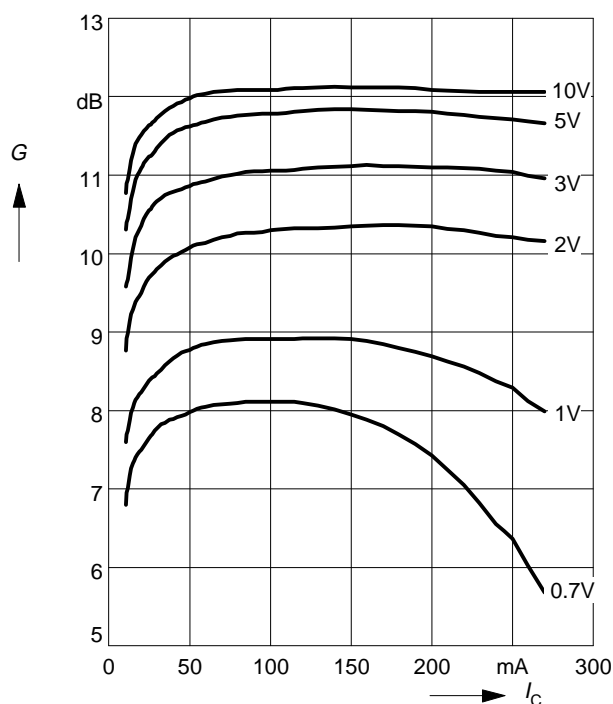
$V_{CE} = \text{Parameter}$



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

$f = 0.9\text{GHz}$

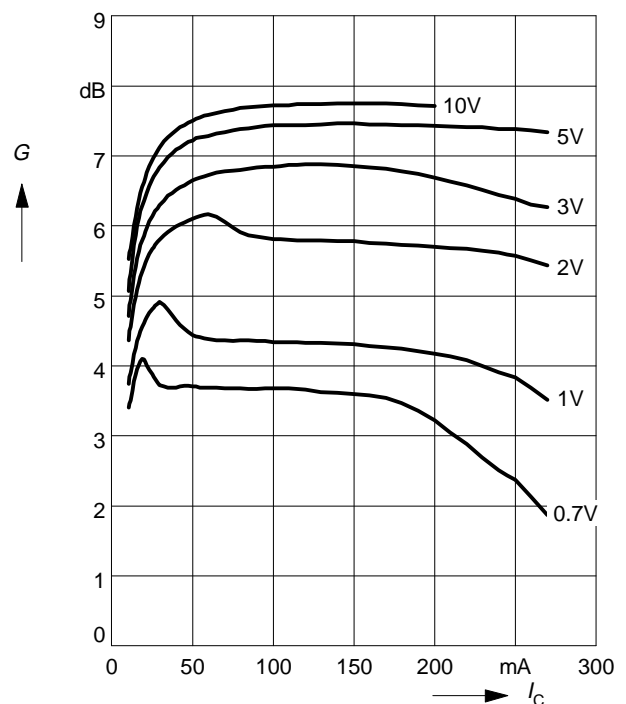
$V_{CE} = \text{Parameter}$



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

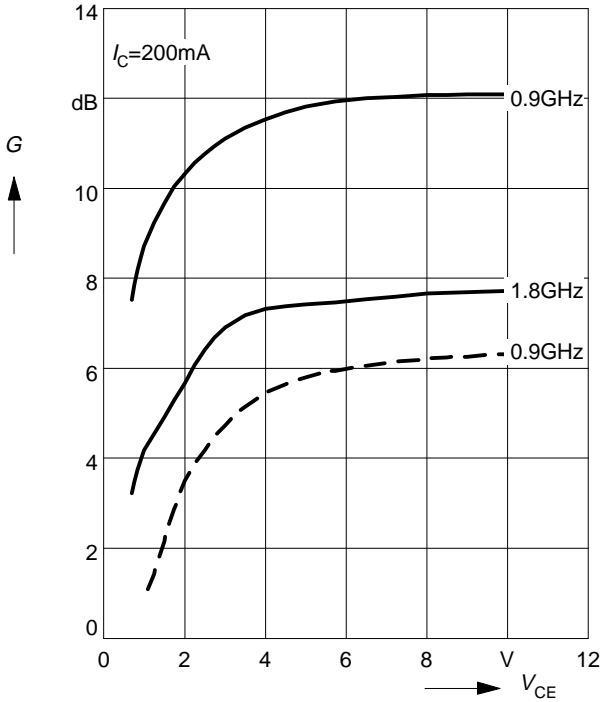
$f = 1.8\text{GHz}$

$V_{CE} = \text{Parameter}$



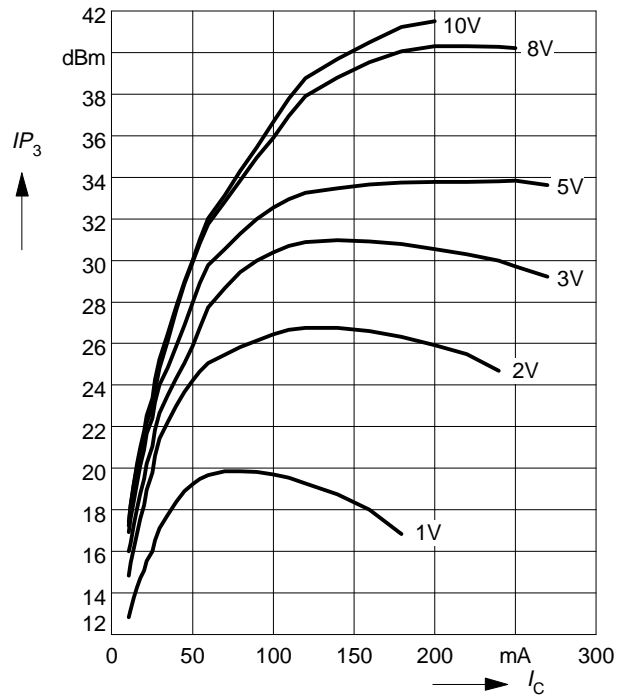
**Power Gain**  $G_{ma}, G_{ms} = f(V_{CE})$ : \_\_\_\_\_  
 $|S_{21}|^2 = f(V_{CE})$ : -----

$f =$  Parameter



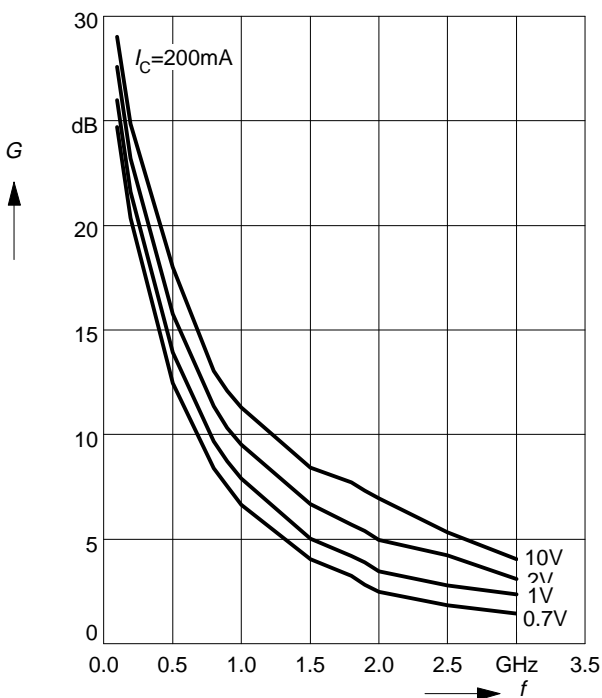
**Intermodulation Intercept Point**  $IP_3 = f(I_C)$   
 (3rd order, Output,  $Z_S = Z_L = 50\Omega$ )

$V_{CE} =$  Parameter,  $f = 900\text{MHz}$



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

$V_{CE} =$  Parameter



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

$V_{CE} =$  Parameter

