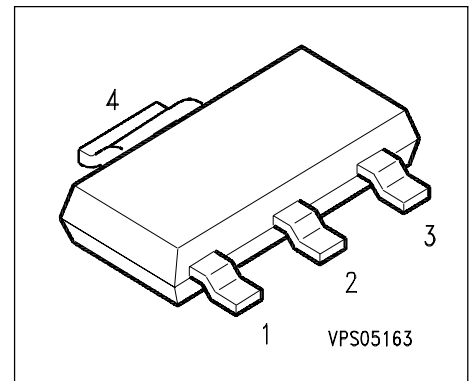## NPN Silicon RF Transistor

- 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: **E**lectro**s**tatic **d**ischarge 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 [1]	R_{thJS}	≤ 35	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 $V_{CE} = 25$ V, $V_{BE} = 0$	I_{CES}	-	-	200	µA
Collector-base cutoff current $V_{CB} = 10$ V, $I_E = 0$	I_{CBO}	-	-	100	nA
Emitter-base cutoff current $V_{EB} = 1$ V, $I_C = 0$	I_{EBO}	-	-	2	µA
DC current gain $I_C = 200$ mA, $V_{CE} = 5$ V	h_{FE}	50	120	250	-

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

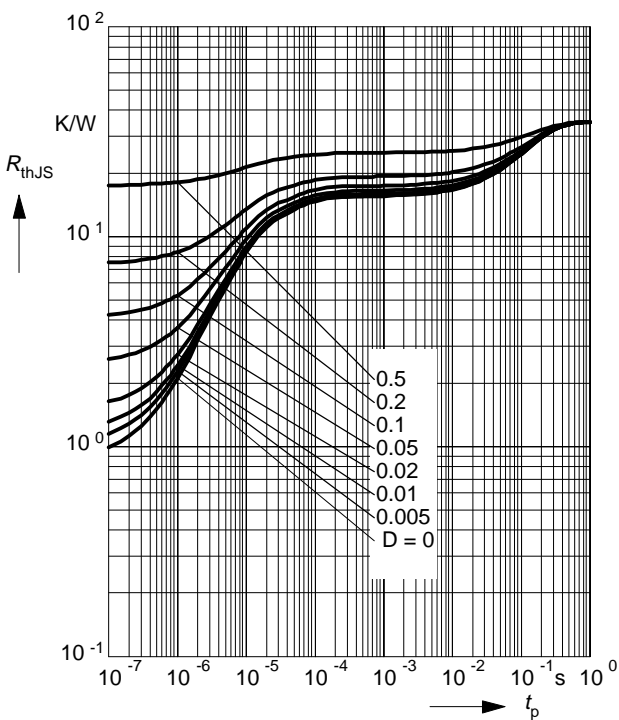| Parameter	Symbol	Values			Unit
		min.	typ.	max.	
AC Characteristics					
Transition frequency	f_T				GHz
I_C = 200 mA, V_{CE} = 8 V, f = 200 MHz		4	5.5	-	
Collector-base capacitance	C_{cb}				pF
V_{CB} = 10 V, f = 1 MHz		-	2.6	3.6	
Collector-emitter capacitance	C_{ce}				
V_{CE} = 10 V, f = 1 MHz	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

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

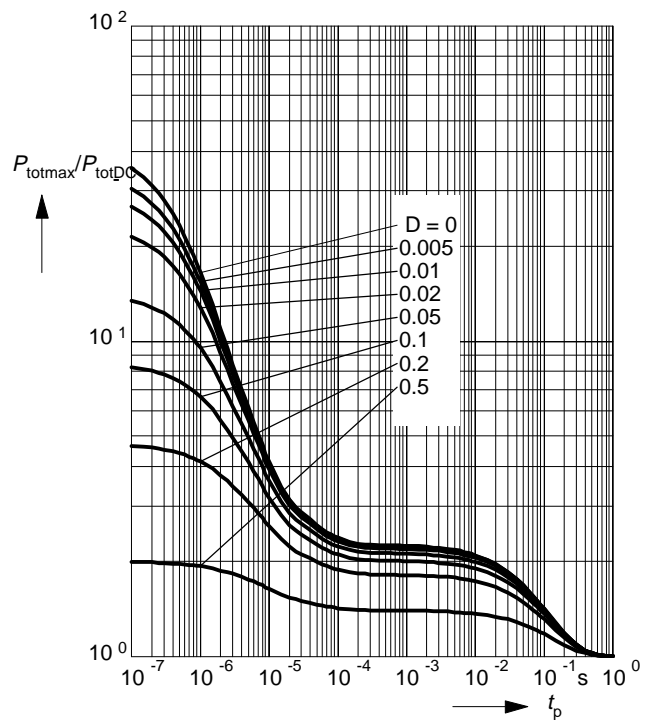## Total power dissipation $P_{tot} = f(T_A{}^*, T_S)$

* Package mounted on epoxy

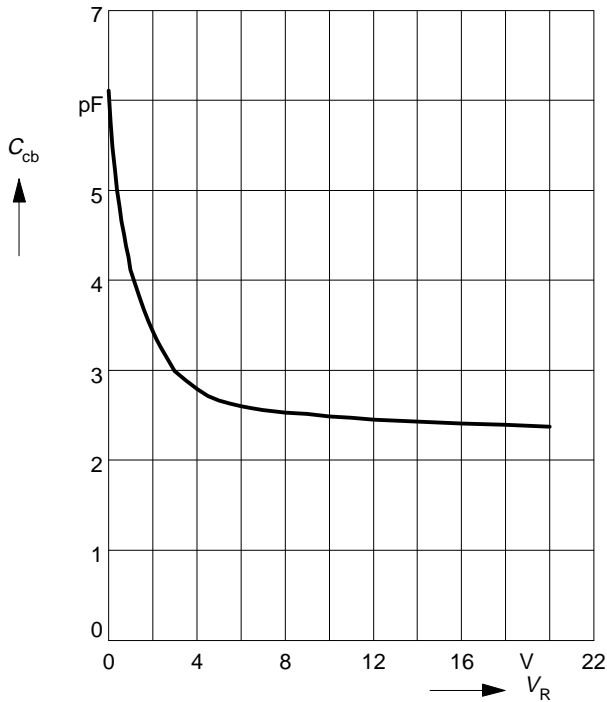
Permissible Pulse Load $R_{thJS} = f(t_p)$

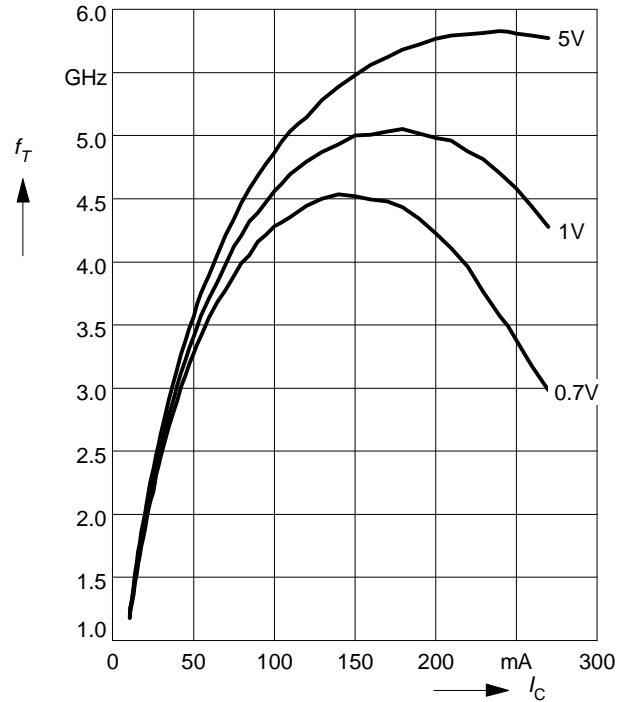## Permissible Pulse Load $P_{totmax}/P_{totDC} = f(t_p)$

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

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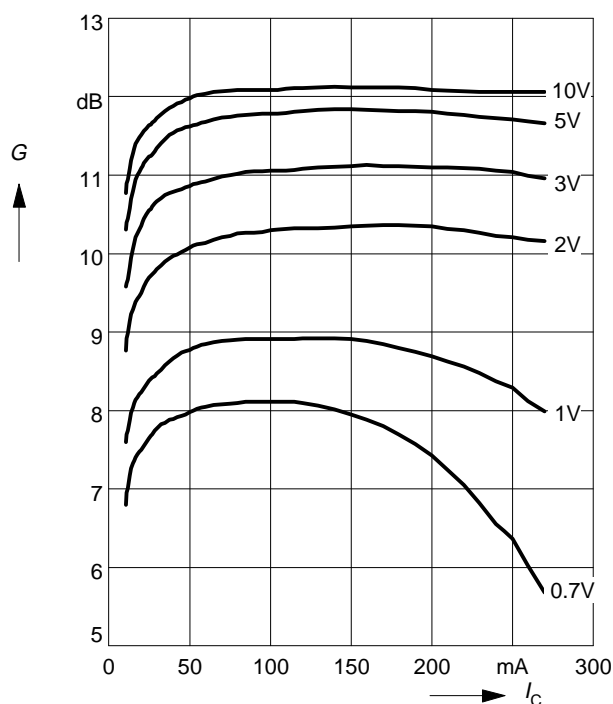

Transition frequency $f_T = f(I_C)$

V_{CE} = Parameter

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

$f = 0.9GHz$

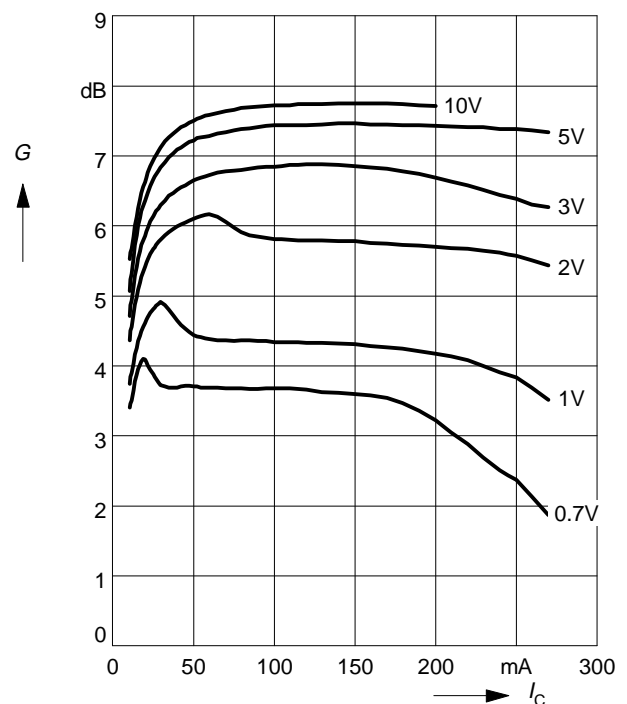V_{CE} = Parameter

Power Gain G_{ma}, $G_{ms} = f(I_C)$
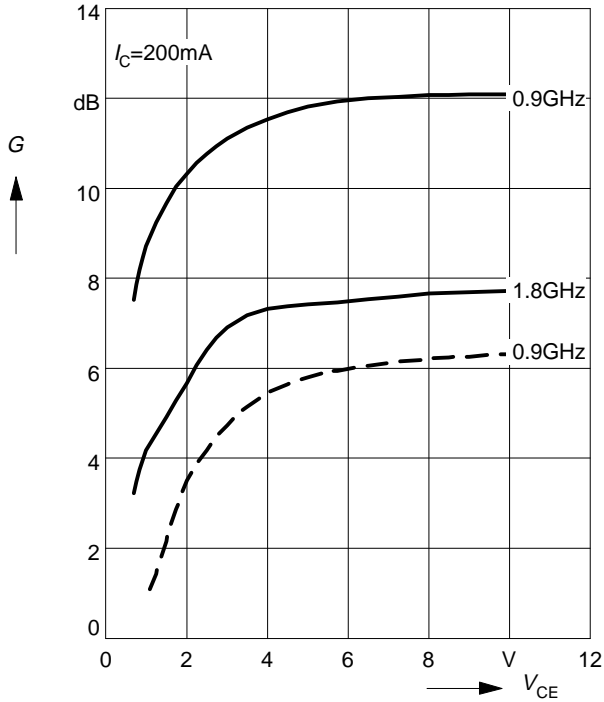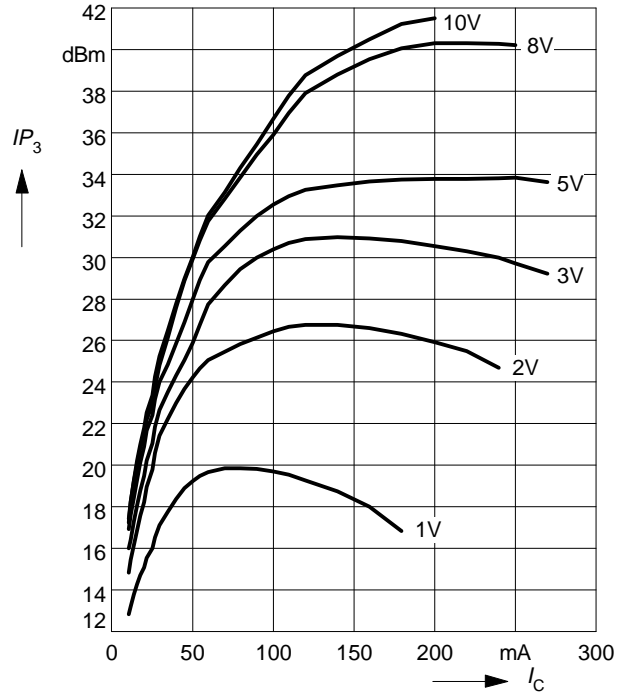
$f = 1.8GHz$

V_{CE} = Parameter

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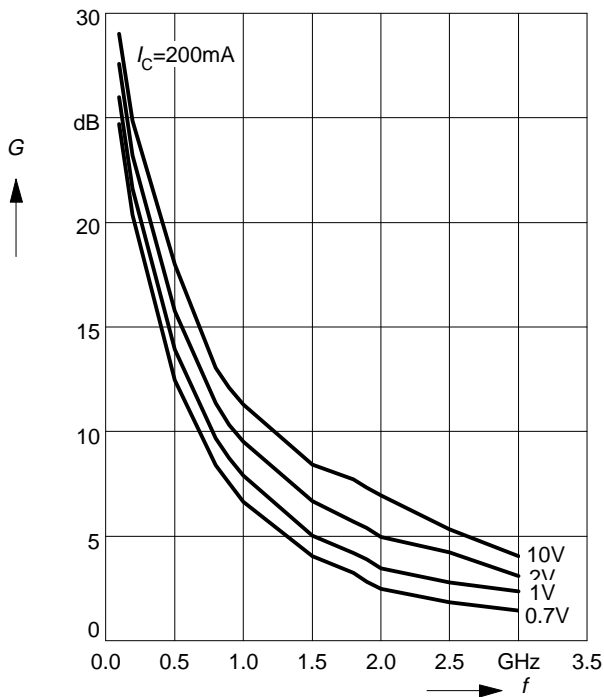$|S_{21}|^2 = f(V_{CE})$:---------

f = Parameter

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