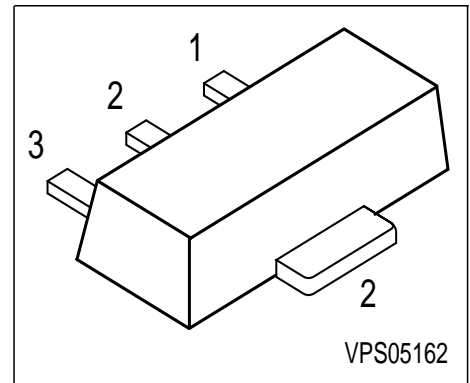


**NPN Silicon RF Transistor**

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



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

Type	Marking	Pin Configuration			Package
BFQ19S	FG	1 = B	2 = C	3 = E	SOT89

**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	$I_C$	75	mA
Base current	$I_B$	10	
Total power dissipation $T_S \leq 85 \text{ }^\circ\text{C}$ <sup>1)</sup>	$P_{tot}$	1	W
Junction temperature	$T_j$	150	$^\circ\text{C}$
Ambient temperature	$T_A$	-65 ... 150	
Storage temperature	$T_{stg}$	-65 ... 150	

**Thermal Resistance**

Junction - soldering point <sup>2)</sup>	$R_{thJS}$	$\leq 65$	K/W
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<sup>1</sup>  $T_S$  is measured on the collector lead at the soldering point to the pcb

<sup>2</sup> For calculation of  $R_{thJA}$  please refer to Application Note Thermal Resistance

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

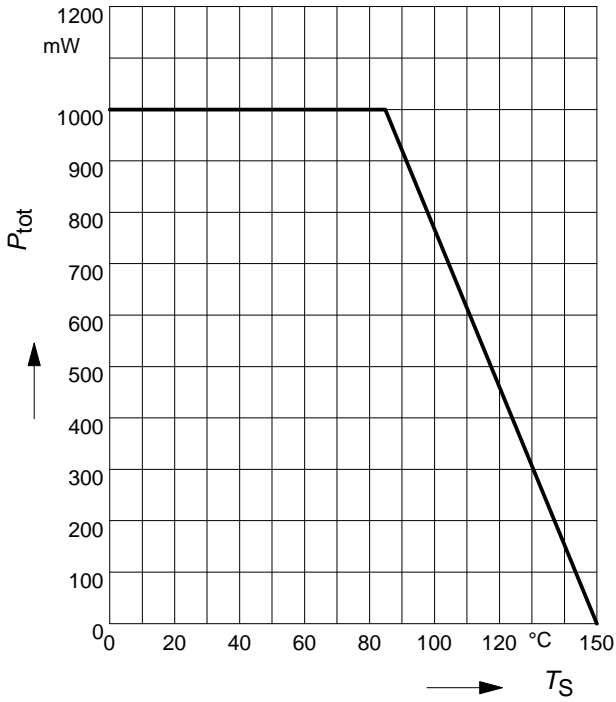
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
<b>DC characteristics</b>					
Collector-emitter breakdown voltage $I_C = 1 \text{ mA}, I_B = 0$	$V_{(BR)CEO}$	15	-	-	V
Collector-emitter cutoff current $V_{CE} = 20 \text{ V}, V_{BE} = 0$	$I_{CES}$	-	-	100	$\mu\text{A}$
Collector-base cutoff current $V_{CB} = 10 \text{ V}, I_E = 0$	$I_{CBO}$	-	-	100	nA
Emitter-base cutoff current $V_{EB} = 2 \text{ V}, I_C = 0$	$I_{EBO}$	-	-	10	$\mu\text{A}$
DC current gain $I_C = 70 \text{ mA}, V_{CE} = 8 \text{ V}$	$h_{FE}$	40	100	220	-

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

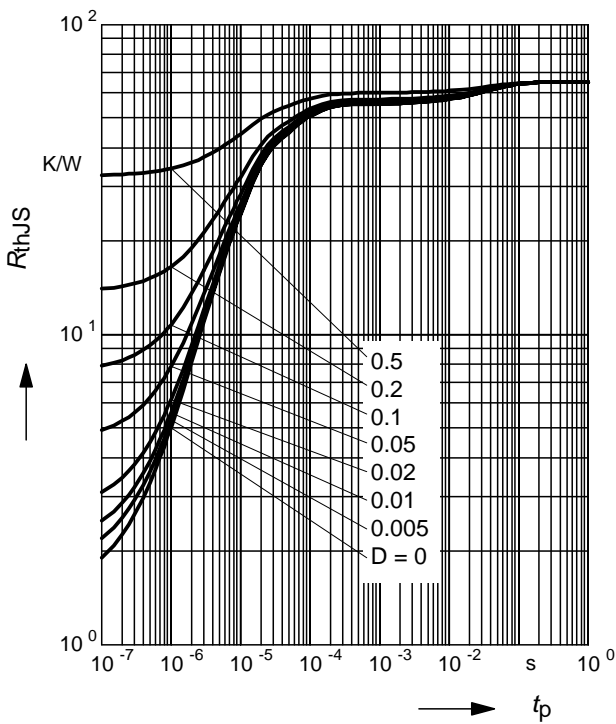
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
<b>AC characteristics</b> (verified by random sampling)					
Transition frequency $I_C = 70 \text{ mA}$ , $V_{CE} = 8 \text{ V}$ , $f = 500 \text{ MHz}$	$f_T$	4	5.5	-	GHz
Collector-base capacitance $V_{CB} = 10 \text{ V}$ , $f = 1 \text{ MHz}$	$C_{cb}$	-	1	1.5	pF
Collector-emitter capacitance $V_{CE} = 10 \text{ V}$ , $f = 1 \text{ MHz}$	$C_{ce}$	-	0.4	-	
Emitter-base capacitance $V_{EB} = 0.5 \text{ V}$ , $f = 1 \text{ MHz}$	$C_{eb}$	-	4.4	-	
Noise figure $I_C = 20 \text{ mA}$ , $V_{CE} = 8 \text{ V}$ , $Z_S = Z_{Sopt}$ , $f = 900 \text{ MHz}$ $f = 1.8 \text{ GHz}$	$F$	-	2.5 4	-	dB
Power gain, maximum available <sup>1)</sup> $I_C = 70 \text{ mA}$ , $V_{CE} = 8 \text{ V}$ , $Z_S = Z_{Sopt}$ , $Z_L = Z_{Lopt}$ , $f = 900 \text{ MHz}$ $f = 1.8 \text{ GHz}$	$G_{ma}$	-	11.5 7	-	
Transducer gain $I_C = 30 \text{ mA}$ , $V_{CE} = 8 \text{ V}$ , $Z_S = Z_L = 50\Omega$ , $f = 900 \text{ MHz}$ $f = 1.8 \text{ GHz}$	$ S_{21e} ^2$	-	9.5 4	-	
Third order intercept point $I_C = 70 \text{ mA}$ , $V_{CE} = 8 \text{ V}$ , $Z_S = Z_{Sopt}$ , $Z_L = Z_{Lopt}$ , $f = 1.8 \text{ GHz}$	$IP_3$	-	35	-	dBm

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

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



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



**Permissible Pulse Load**

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

