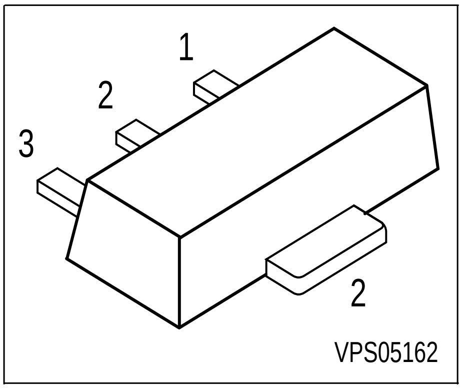
NPN Silicon RF Transistor

- 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: **E**lectro**s**tatic **d**ischarge 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 $T_S \leq 85$ °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[2]	R_{thJS}	≤ 65	K/W

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

[2] For calculation of R_{thJA} please refer to Application Note Thermal Resistance

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}	-	1	1.5	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}	-	4.4	-	
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 1) 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}	 - -	 11.5 7	 - -	
Transducer gain I_C = 30 mA, V_{CE} = 8 V, $Z_S = Z_L = 50\Omega$, f = 900 MHz f = 1.8 GHz	$\|S_{21e}\|^2$	 - -	 9.5 4	 - -	
Third order intercept point I_C = 70 mA, V_{CE} = 8 V, $Z_S=Z_{Sopt}$, $Z_L=Z_{Lopt}$, f = 1.8 GHz	IP_3	-	35	-	dBm

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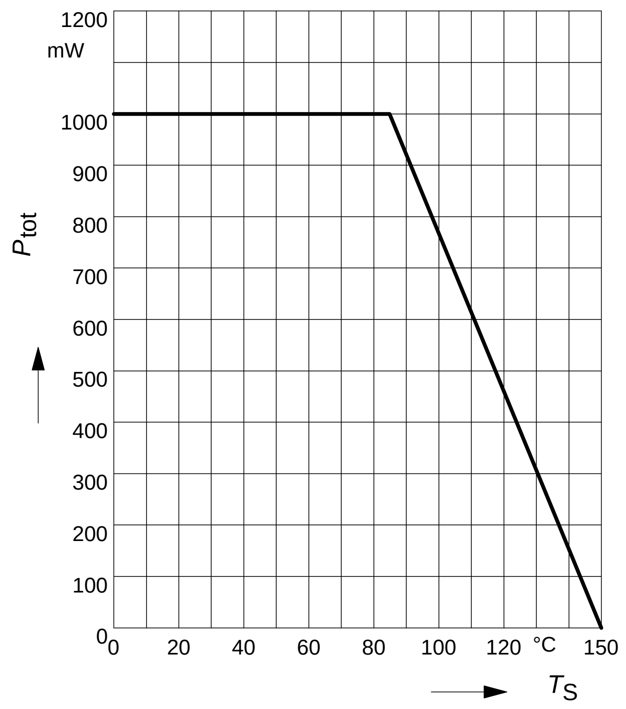
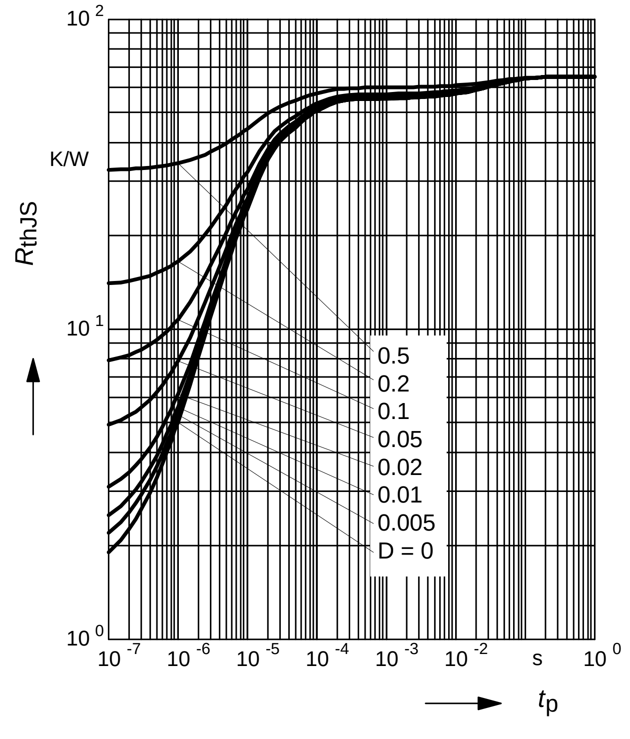
[1] $G_{ma} = |S_{21} / S_{12}|\ (k-(k^2-1)^{1/2})$

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



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



Permissible Pulse Load

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