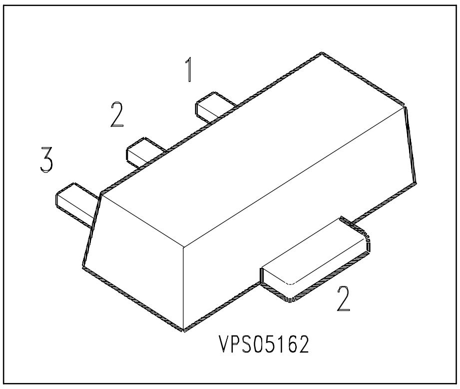
NPN Silicon RF Transistor



- For low noise, high-gain amplifiers up to 2GHz
- For linear broadband amplifiers
- f_T = 7.5 GHz
  F = 1.3 dB at 900 MHz

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

Type	Marking	Ordering Code	Pin Configuration			Package
BFQ 193	RCs	Q62702-F1312	1 = B	2 = C	3 = E	SOT-89

Maximum Ratings

Parameter	Symbol	Values	Unit
Collector-emitter voltage	V_{CEO}	12	V
Collector-base voltage	V_{CBO}	20	
Emitter-base voltage	V_{EBO}	2	
Collector current	I_C	80	mA
Base current	I_B	10	
Total power dissipation $T_S \leq 93$ °C	P_{tot}	600	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}	≤ 95	K/W

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

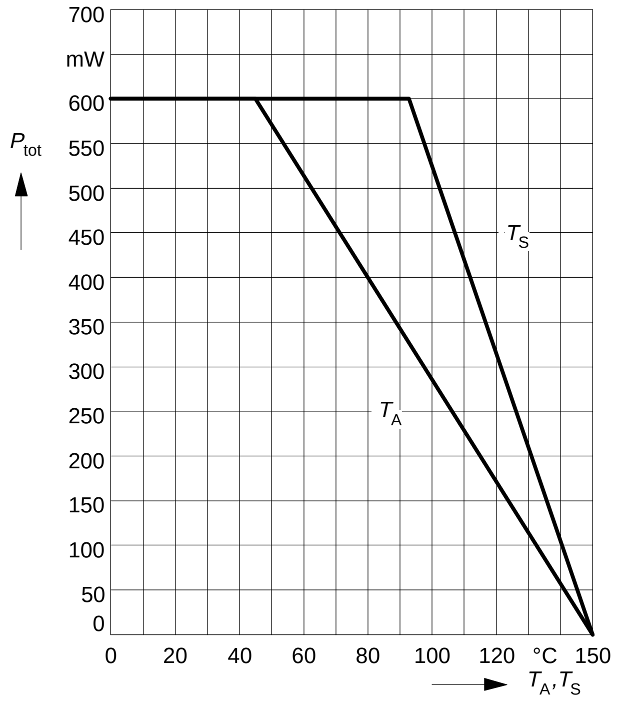
Parameter	**Symbol**	**Values**			**Unit**
		min.	typ.	max.	
DC Characteristics					
Collector-emitter breakdown voltage I_C = 1 mA, I_B = 0	$V_{(BR)CEO}$	12	-	-	V
Collector-emitter cutoff current V_{CE} = 20 V, V_{BE} = 0	I_{CES}	-	-	100	µA
Collector-base cutoff current V_{CB} = 10 V, I_E = 0	I_{CBO}	-	-	100	nA
Emitter-base cutoff current V_{EB} = 1 V, I_C = 0	I_{EBO}	-	-	1	µA
DC current gain I_C = 30 mA, V_{CE} = 8 V	h_{FE}	50	100	200	-

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

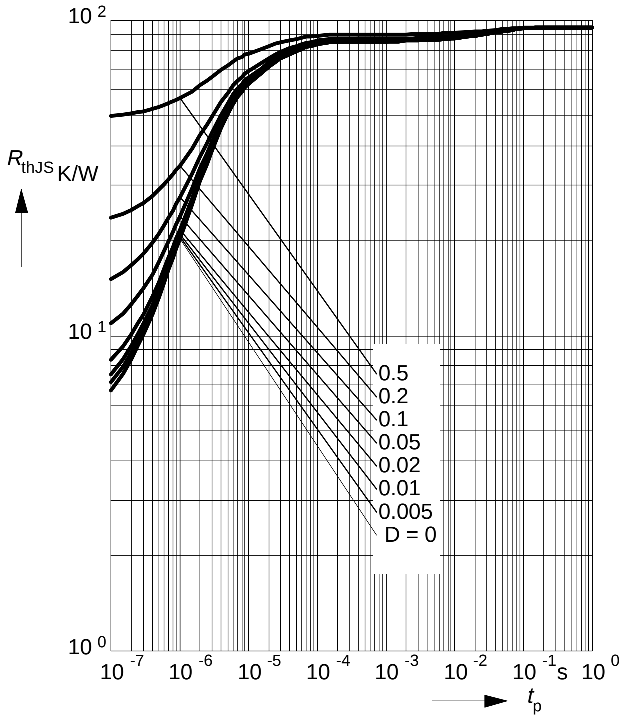
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
AC Characteristics					
Transition frequency I_C = 50 mA, V_{CE} = 8 V, f = 500 MHz	f_T	5.5	7.5	-	GHz
Collector-base capacitance V_{CB} = 10 V, f = 1 MHz	C_{cb}	-	0.78	1.2	pF
Collector-emitter capacitance V_{CE} = 10 V, f = 1 MHz	C_{ce}	-	0.36	-	
Emitter-base capacitance V_{EB} = 0.5 V, f = 1 MHz	C_{eb}	-	2.1	-	
Noise figure I_C = 10 mA, V_{CE} = 8 V, $Z_S = Z_{Sopt}$	F				dB
f = 900 MHz		-	1.3	-	
f = 1.8 GHz		-	2.1	-	
Power gain [2)] I_C = 30 mA, V_{CE} = 8 V, $Z_S = Z_{Sopt}$ $Z_L = Z_{Lopt}$	G_{ma}				
f = 900 MHz		-	14	-	
f = 1.8 GHz		-	8	-	
Transducer gain I_C = 30 mA, V_{CE} = 8 V, $Z_S = Z_L$ = 50 Ω	$\|S_{21e}\|^2$				
f = 900 MHz		-	11.5	-	
f = 1.8 GHz		-	6	-	

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