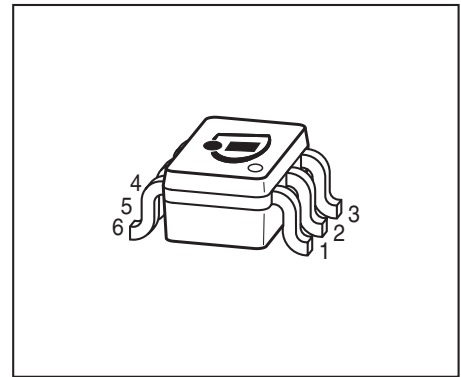


NPN Silicon RF Transistor

- For broadband amplifiers up to 1 GHz at collector currents from 1 mA to 20 mA
- BFS17S: For orientation in reel see package information below
- Pb-free (RoHS compliant) package



ESD (Electrostatic discharge) sensitive device, observe handling precaution!

Type	Marking	Pin Configuration						Package
BFS17S	MCs	1=B1	2=E1	3=C2	4=B2	5=E2	6=C1	SOT363

Maximum Ratings at $T_A = 25\text{ °C}$, unless otherwise specified

Parameter	Symbol	Value	Unit
Collector-emitter voltage	V_{CEO}	15	V
Collector-base voltage	V_{CBO}	25	
Emitter-base voltage	V_{EBO}	2.5	
Collector current	I_C	25	mA
Peak collector current, $f = 10\text{ MHz}$	I_{CM}	50	
Total power dissipation ¹⁾ $T_S \leq 93\text{ °C}$	P_{tot}	280	mW
Junction temperature	T_J	150	°C
Ambient temperature	T_A	-65 ... 150	
Storage temperature	T_{Stg}	-65 ... 150	

Thermal Resistance

Parameter	Symbol	Value	Unit
Junction - soldering point ²⁾	R_{thJS}	≤ 240	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 AN077 (Thermal Resistance Calculation)

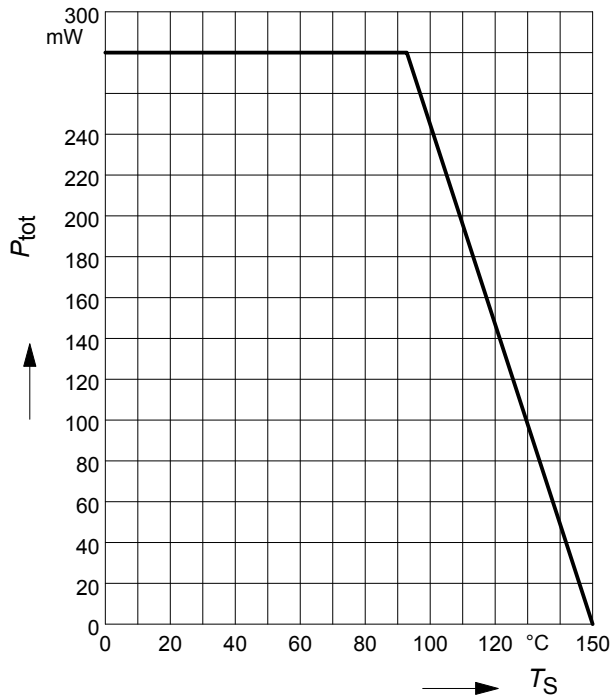
Electrical Characteristics at $T_A = 25^\circ\text{C}$, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
DC Characteristics					
Collector-emitter breakdown voltage $I_C = 1\text{ mA}$, $I_B = 0$	$V_{(BR)CEO}$	15	-	-	V
Collector-base cutoff current $V_{CB} = 10\text{ V}$, $I_E = 0$ $V_{CB} = 25\text{ V}$, $I_E = 0$	I_{CBO}	- -	- -	0.05 10	μA
Emitter-base cutoff current $V_{EB} = 2.5\text{ V}$, $I_C = 0$	I_{EBO}	-	-	100	
DC current gain $I_C = 2\text{ mA}$, $V_{CE} = 1\text{ V}$, pulse measured $I_C = 25\text{ mA}$, $V_{CE} = 1\text{ V}$, pulse measured	h_{FE}	40 20	- 70	150 -	-
Collector-emitter saturation voltage $I_C = 10\text{ mA}$, $I_B = 1\text{ mA}$	V_{CEsat}	-	0.1	0.4	V

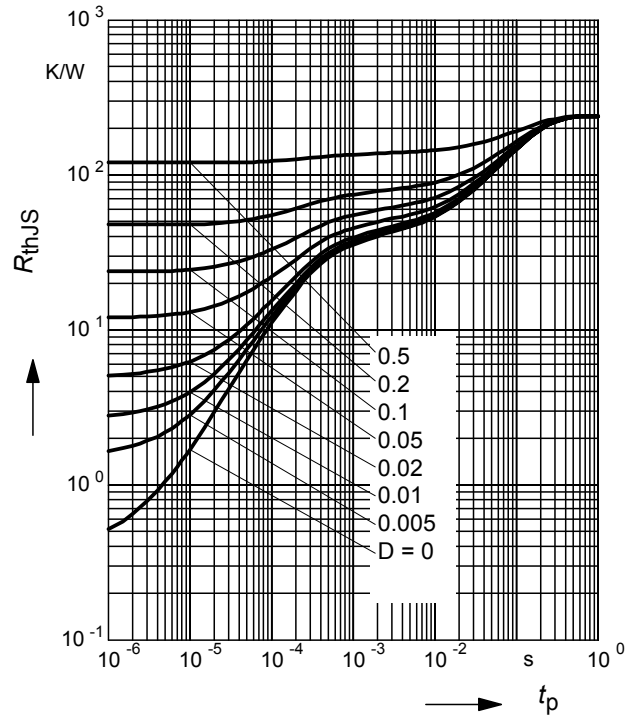
Electrical Characteristics at $T_A = 25^\circ\text{C}$, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
AC Characteristics (verified by random sampling)					
Transition frequency $I_C = 2\text{ mA}$, $V_{CE} = 5\text{ V}$, $f = 200\text{ MHz}$ $I_C = 25\text{ mA}$, $V_{CE} = 5\text{ V}$, $f = 200\text{ MHz}$	f_T	1 1.3	1.4 2.5	- -	GHz
Collector-base capacitance $V_{CB} = 5\text{ V}$, $f = 1\text{ MHz}$, $V_{BE} = 0$, emitter grounded	C_{cb}	-	0.55	0.8	pF
Collector emitter capacitance $V_{CE} = 5\text{ V}$, $f = 1\text{ MHz}$, $V_{BE} = 0$, base grounded	C_{ce}	-	0.2	-	
Emitter-base capacitance $V_{EB} = 0.5\text{ V}$, $f = 1\text{ MHz}$, $V_{CB} = 0$, collector grounded	C_{eb}	-	0.9	1.45	
Minimum noise figure $I_C = 2\text{ mA}$, $V_{CE} = 5\text{ V}$, $Z_S = 50\text{ }\Omega$, $f = 800\text{ MHz}$	NF_{min}	-	3	5	dB
Transducer gain $I_C = 20\text{ mA}$, $V_{CE} = 5\text{ V}$, $Z_S = Z_L = 50\Omega$, $f = 500\text{ MHz}$	$ S_{21e} ^2$	-	14	-	dB
Third order intercept point at output $V_{CE} = 5\text{ V}$, $I_C = 20\text{ mA}$, $f = 800\text{ MHz}$, $Z_S = Z_{Sopt}$, $Z_L = Z_{Lopt}$	IP_3	-	22.5	-	dBm
1dB compression point $I_C = 20\text{ mA}$, $V_{CE} = 5\text{ V}$, $Z_S = Z_L = 50\Omega$, $f = 800\text{ MHz}$	P_{-1dB}	-	11	-	-

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

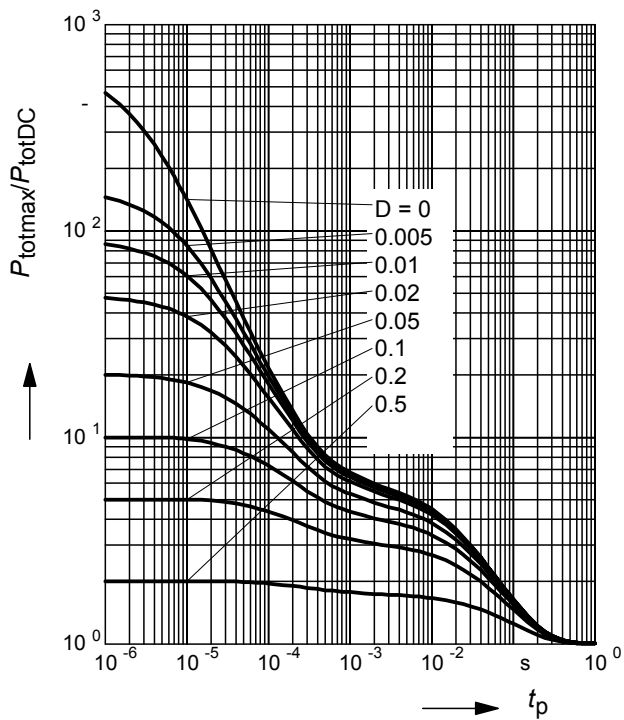


Permissible Pulse Load $R_{\text{thJS}} = f(t_p)$



Permissible Pulse Load

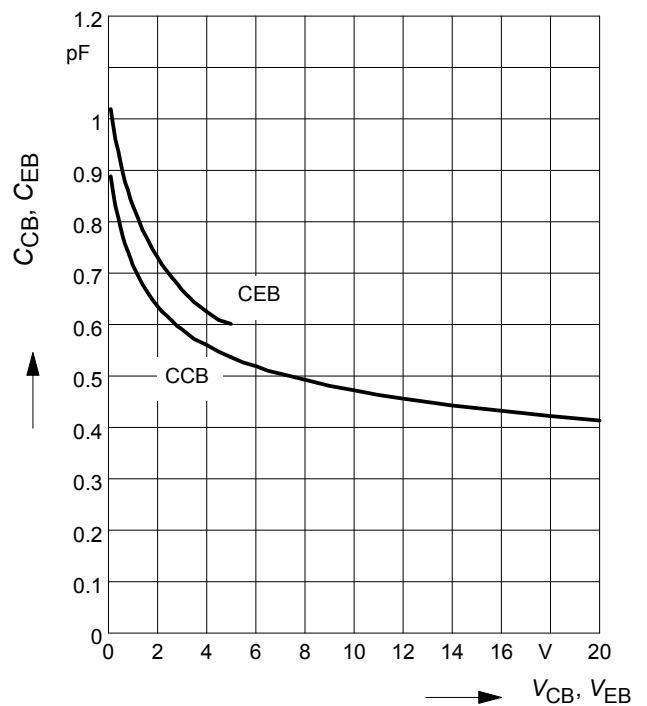
$$P_{\text{totmax}}/P_{\text{totDC}} = f(t_p)$$



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

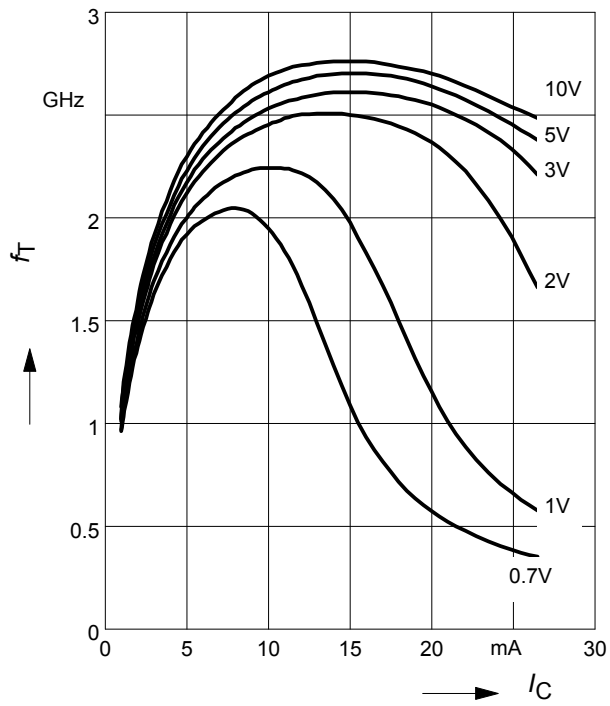
Emitter-base capacitance $C_{\text{eb}} = f(V_{\text{EB}})$

$f = 1 \text{ MHz}$



Transition frequency $f_T = f(I_C)$

V_{CE} = parameter



The drawing shows the mechanical specifications for the 6-pin connector. The top view (left) shows a rectangular component with six pins (1-6) and a pin 1 marking. Dimensions include a total width of 2 ± 0.2 mm, a pin pitch of $0.2^{+0.1}_{-0.05}$ mm, and individual pin widths of 0.65 mm. The side view (right) shows a height of 2.1 ± 0.1 mm, a maximum pin height of 0.1 mm, and a minimum pin height of 0.1 mm. The pin diameter is $0.15^{+0.1}_{-0.05}$ mm. The drawing also includes a detail of the pin 1 marking and a table of dimensions.

Symbol	Value	Unit
Φ	0.1	mm
$\square$	0.1	mm
$\square$	0.2	mm
$\square$	0.15	mm

Technical drawing of a 3D-printed part showing dimensions: 0.3, 0.7, 0.9, 1.6, 0.65, and 0.65.

Pin 1 marking
Laser marking

Manufacturer

2005, June
Date code (Year/Month)

BCR108S
Type code

Edition 2009-11-16

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