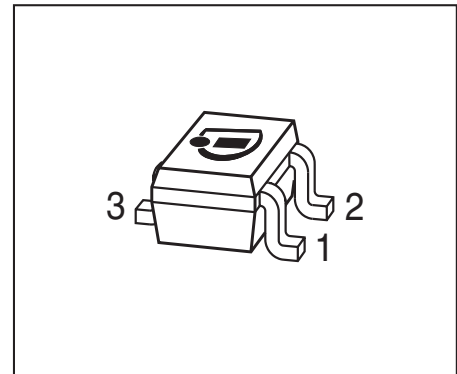


**NPN Silicon RF Transistor**

- For broadband amplifiers up to 1 GHz at collector currents from 1 mA to 20 mA
- Pb-free (RoHS compliant) package



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

Type	Marking	Pin Configuration			Package
BFS17W	MCs	1 = B	2 = E	3 = C	SOT323

**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 <sup>1)</sup> $T_S \leq 93\text{ °C}$	$P_{tot}$	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 <sup>2)</sup>	$R_{thJS}$	$\leq 205$	K/W

<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 AN077 (Thermal Resistance Calculation)

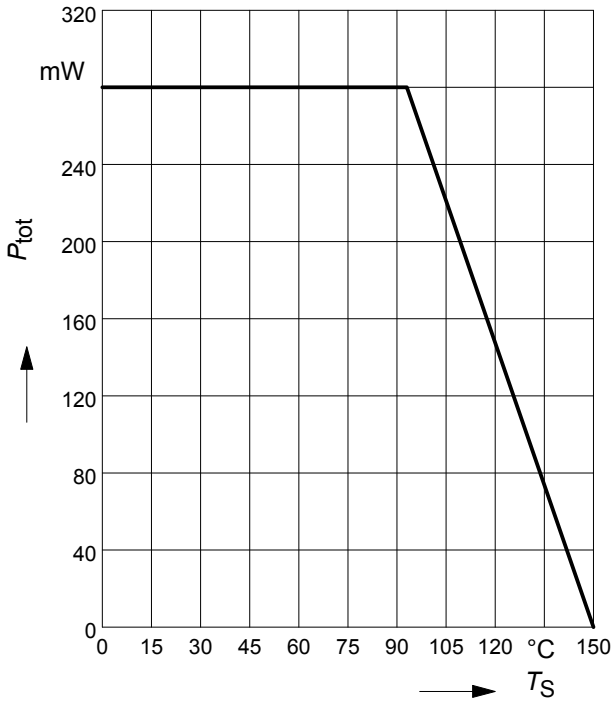
**Electrical Characteristics** at  $T_A = 25^\circ\text{C}$ , unless otherwise specified

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-base cutoff current $V_{CB} = 10\text{ V}, I_E = 0$ $V_{CB} = 25\text{ V}, I_E = 0$	$I_{CBO}$	-	-	0.05 10	$\mu\text{A}$
Emitter-base cutoff current $V_{EB} = 2.5\text{ V}, I_C = 0$	$I_{EBO}$	-	-	100	
DC current gain $I_C = 2\text{ mA}, V_{CE} = 1\text{ V}, \text{ pulse measured}$ $I_C = 25\text{ mA}, V_{CE} = 1\text{ V}, \text{ pulse measured}$	$h_{FE}$	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

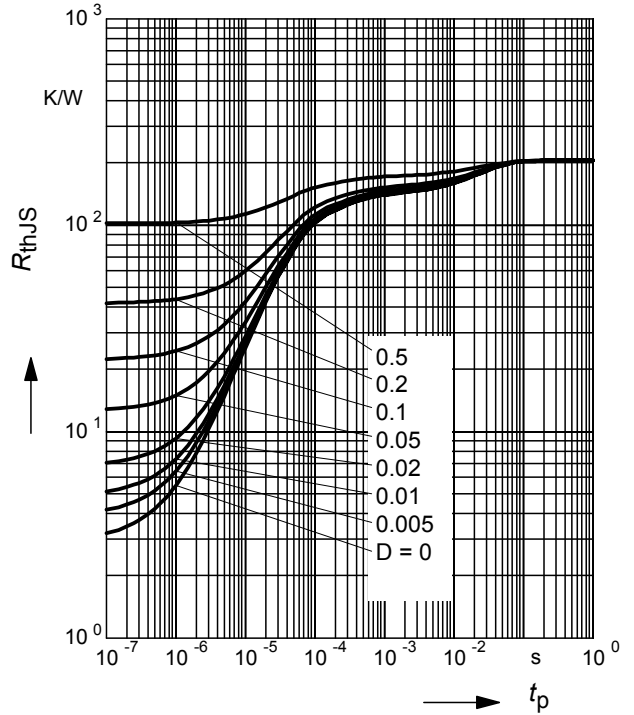
**Electrical Characteristics at  $T_A = 25^\circ\text{C}$ , unless otherwise specified**

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
<b>AC Characteristics (verified by random sampling)</b>					
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	$C_{ce}$	-	0.3	-	
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 $I_C = 2\text{ mA}$ , $V_{CE} = 5\text{ V}$ , $Z_S = 50\ \Omega$ , $f = 800\text{ MHz}$	$NF_{\min}$	-	3.5	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  $P_{tot} = f(T_S)$**

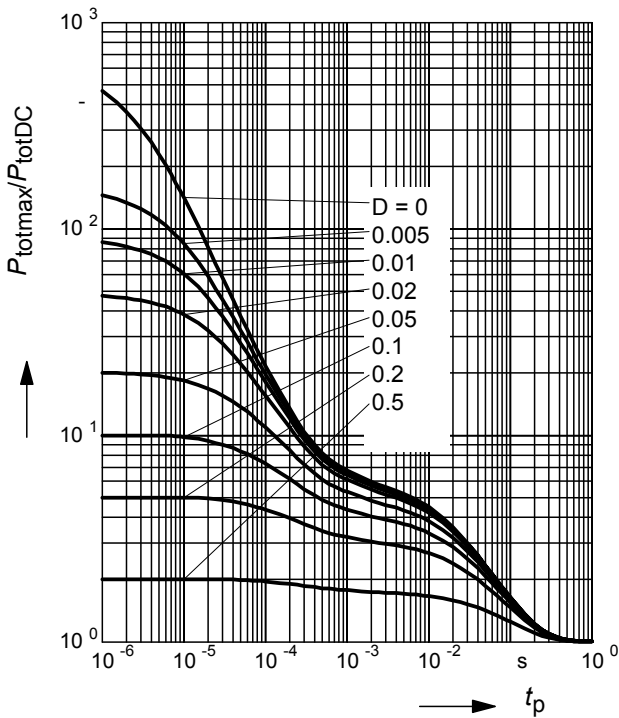


**Permissible Pulse Load  $R_{thJS} = f(t_p)$**



**Permissible Pulse Load**

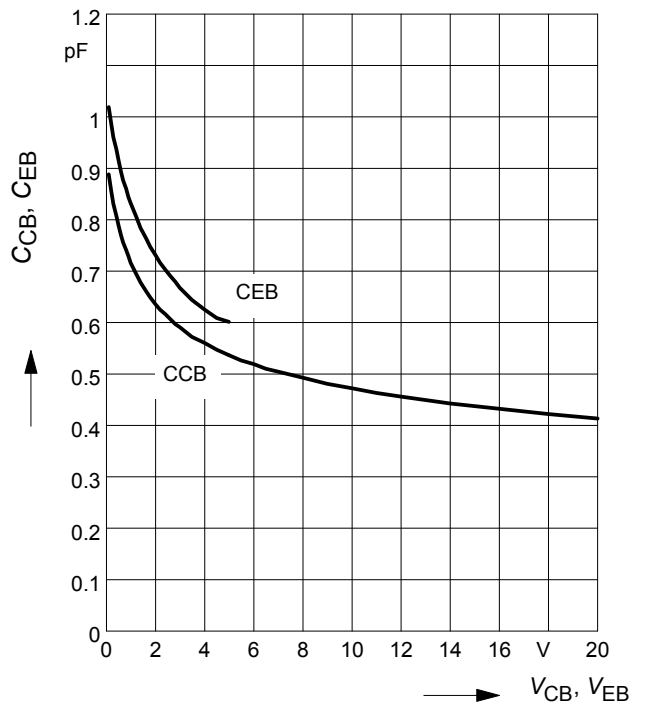
$P_{totmax}/P_{totDC} = f(t_p)$



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

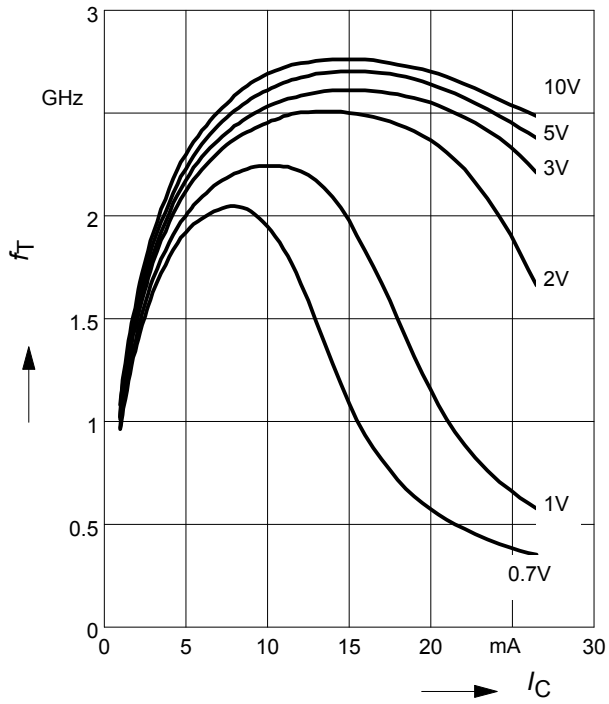
**Emitter-base capacitance  $C_{eb} = f(V_{EB})$**

$f = 1 \text{ MHz}$

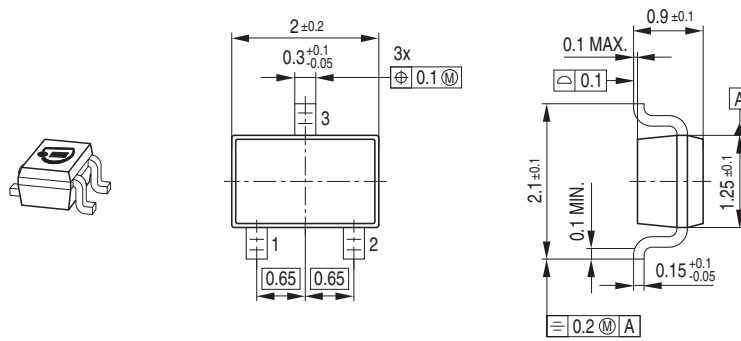


Transition frequency  $f_T = f(I_C)$

$V_{CE}$  = parameter



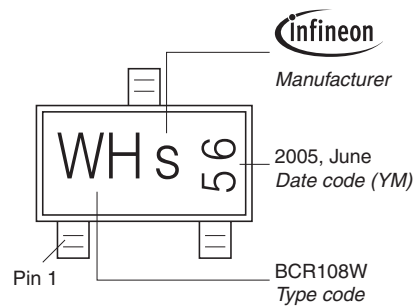
Package Outline



Foot Print

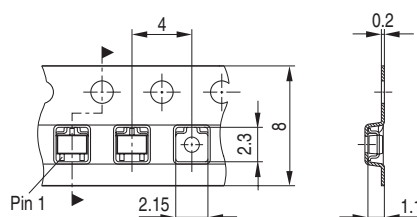


Marking Layout (Example)



Standard Packing

Reel  $\varnothing 180$  mm = 3.000 Pieces/Reel  
 Reel  $\varnothing 330$  mm = 10.000 Pieces/Reel



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