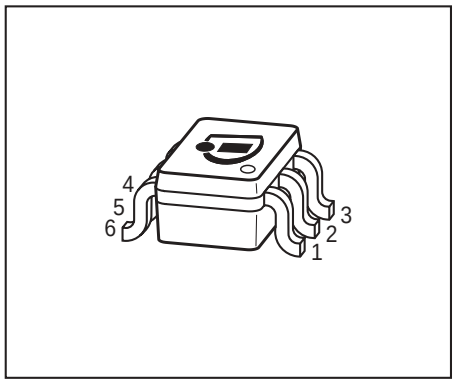
NPN Silicon RF Transistor



- 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[1)]
- Qualified according AEC Q101

AEC Qualified RoHS

ESD (**E**lectro**s**tatic **d**ischarge) 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

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 MHz	I_{CM}	50	
Total power dissipation[2)] $T_S \leq 93$ °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[3)]	R_{thJS}	≤ 240	K/W

[1]Pb-containing package may be available upon special request
[2]T_S is measured on the collector lead at the soldering point to the pcb
[3]For calculation of R_{thJA} please refer to Application Note Thermal Resistance

2007-03-30

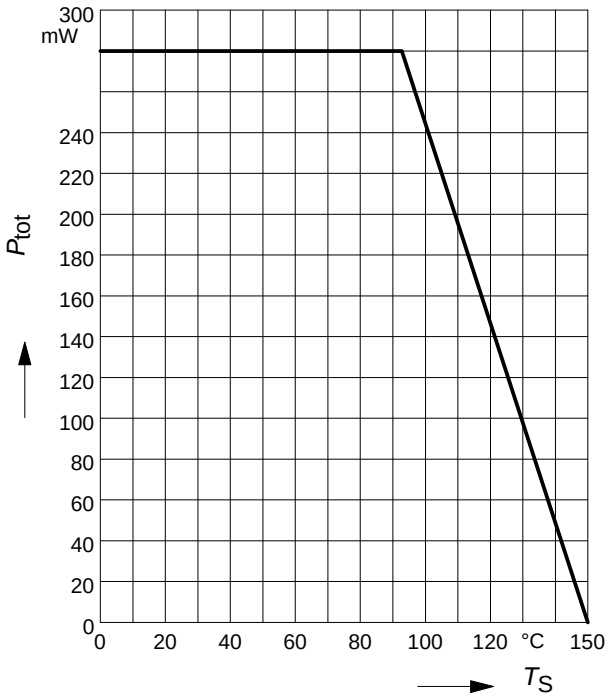
Electrical Characteristics at T_A = 25°C, unless otherwise specified

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-base cutoff current V_{CB} = 10 V, I_E = 0 V_{CB} = 25 V, I_E = 0	I_{CBO}	 - -	 - -	 0.05 10	µA
Emitter-base cutoff current V_{EB} = 2.5 V, I_C = 0	I_{EBO}	-	-	100	
DC current gain- I_C = 2 mA, V_{CE} = 1 V, pulse measured I_C = 25 mA, V_{CE} = 1 V, pulse measured	h_{FE}	 40 20	 - 70	 150 -	-
Collector-emitter saturation voltage I_C = 10 mA, I_B = 1 mA	V_{CEsat}	-	0.1	0.4	V

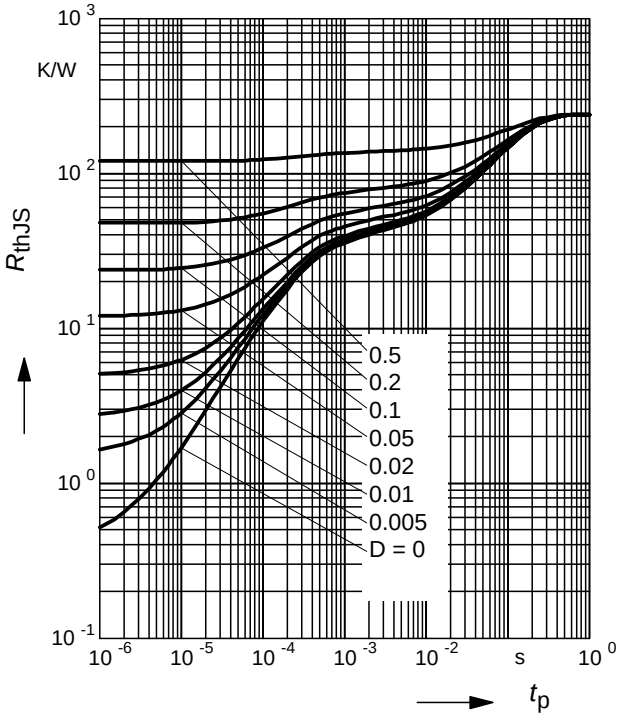
Electrical Characteristics at T_A = 25°C, unless otherwise specified

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

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

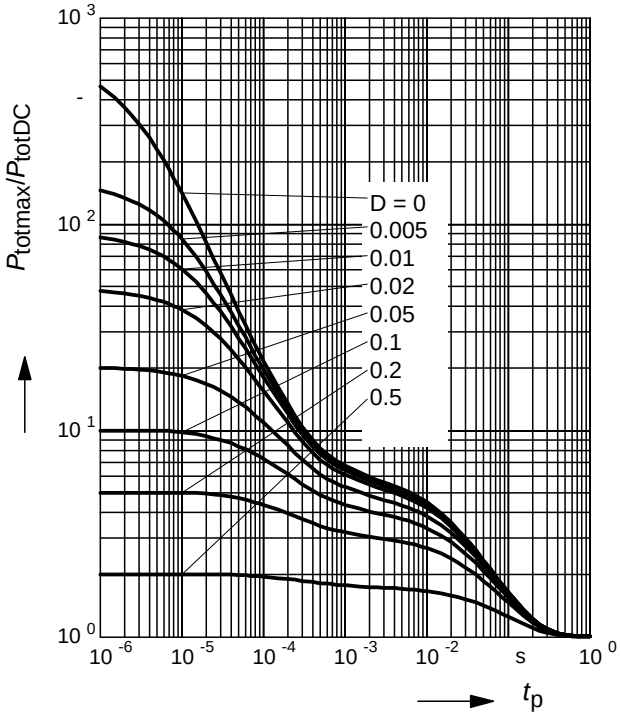


Permissible Pulse Load $R_{thJS} = f(t_p)$



Permissible Pulse Load

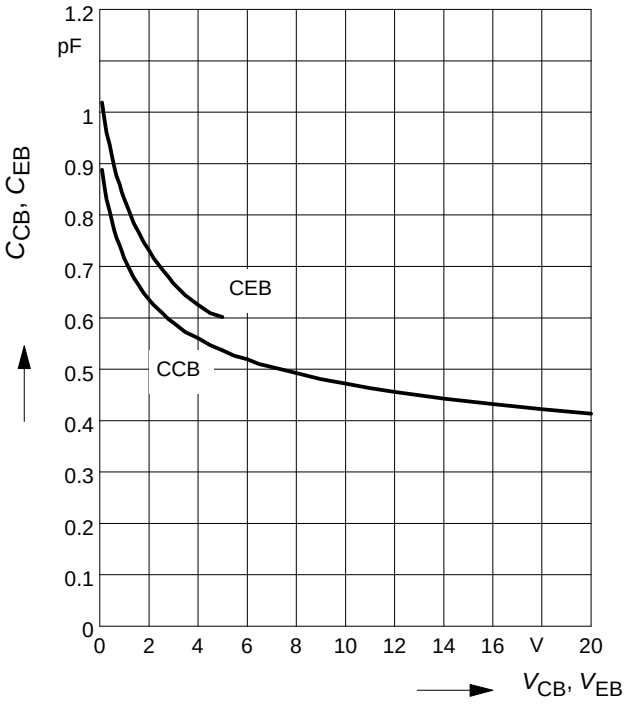
$P_{totmax}/P_{totDC} = f(t_p)$



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

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

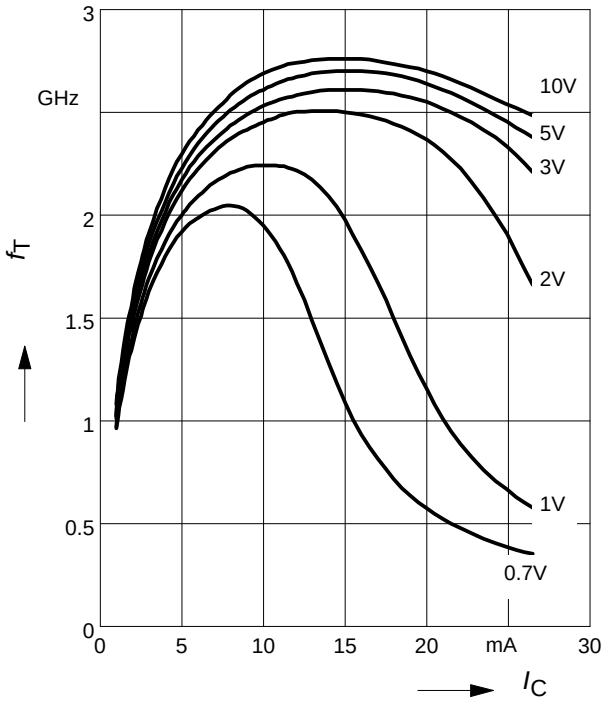
f = 1 MHz



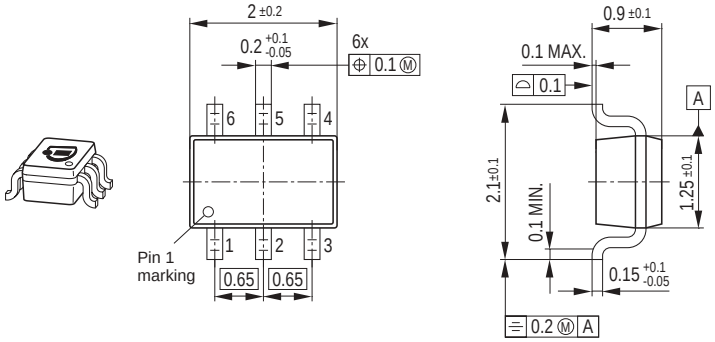
2007-03-30

Transition frequency $f_T = f(I_C)$

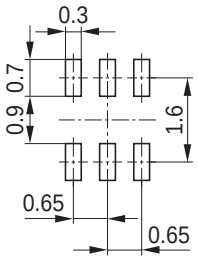
V_{CE} = parameter



Package Outline

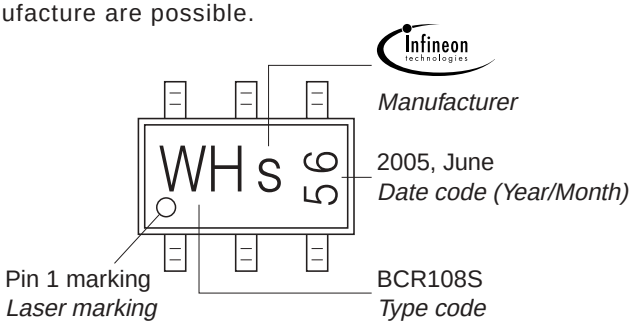


Foot Print



Marking Layout (Example)

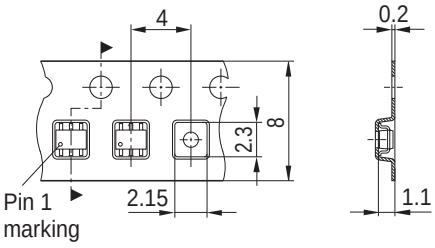
Small variations in positioning of
Date code, Type code and Manufacture are possible.



Standard Packing

Reel ø180 mm = 3.000 Pieces/Reel
Reel ø330 mm = 10.000 Pieces/Reel

For symmetric types no defined Pin 1 orientation in reel.



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