

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
BFS17P	MCs	1 = B	2 = E	3 = C	SOT23

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	I_{CM}	50	
Total power dissipation ¹⁾ $T_S \leq 55\text{ °C}$	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}	≤ 340	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)

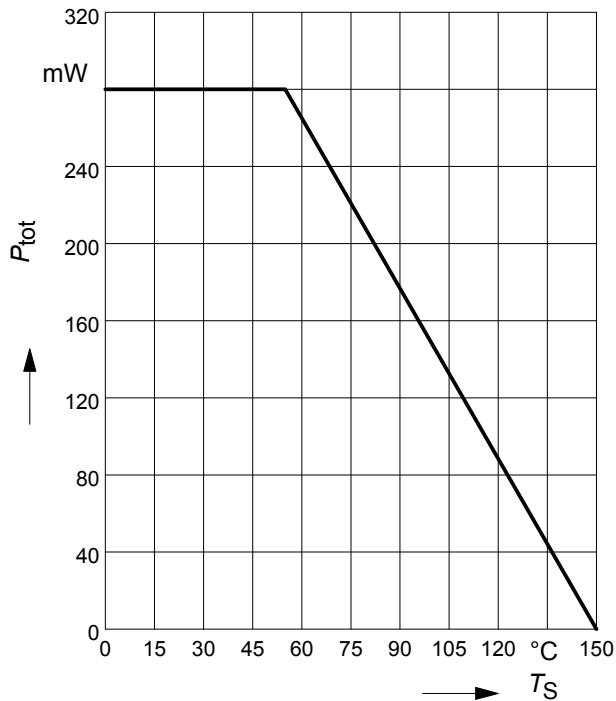
Electrical Characteristics at $T_A = 25^\circ\text{C}$, unless otherwise specified

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

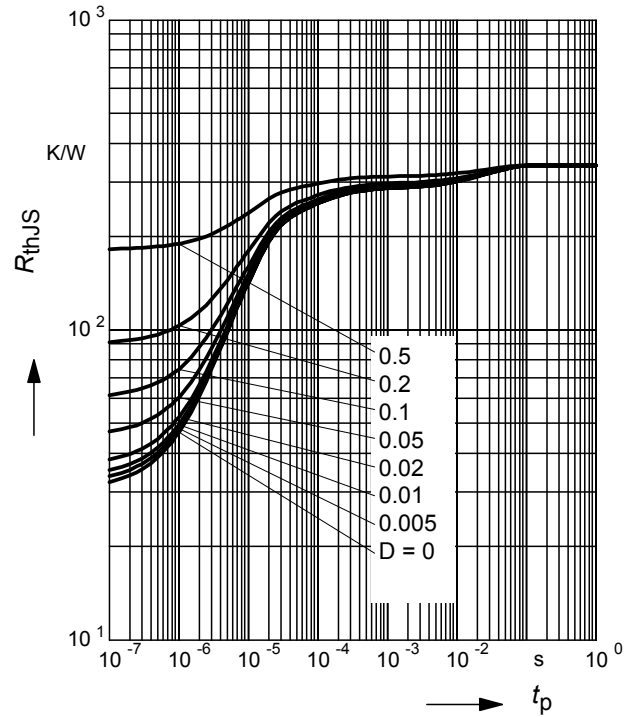
Electrical Characteristics at $T_A = 25^\circ\text{C}$, unless otherwise specified

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}	-	0.27	-	
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	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$	-	13	-	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	-	21.5	-	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}	-	10	-	-

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

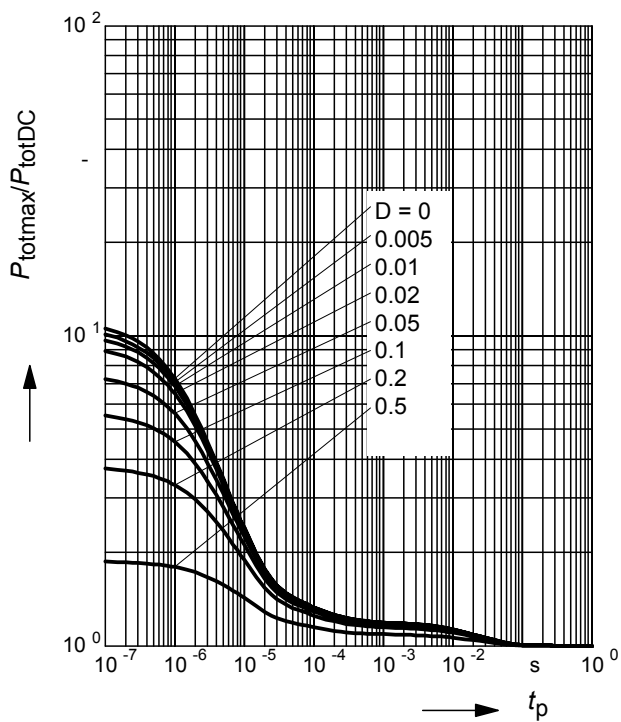


Permissible Pulse Load $R_{\text{thJS}} = f(t_p)$



Permissible Pulse Load

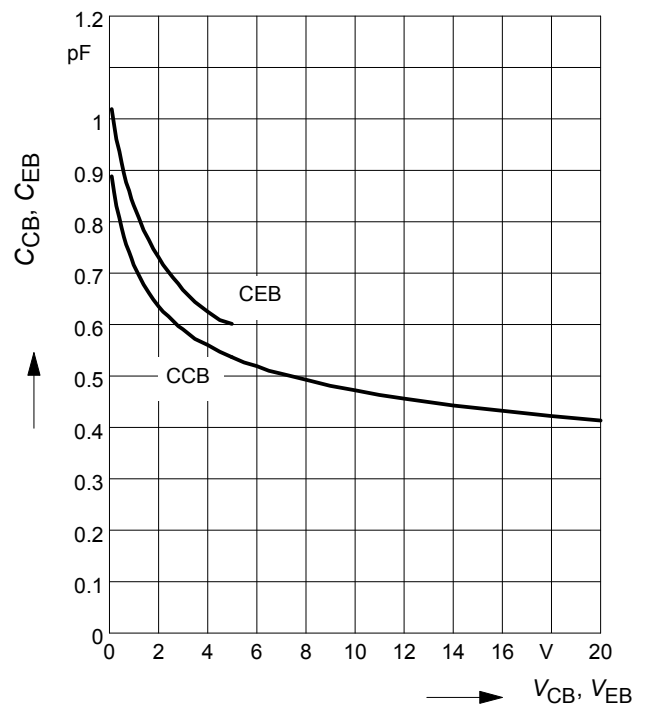
$$P_{\text{totmax}}/P_{\text{totDC}} = f(t_p)$$



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

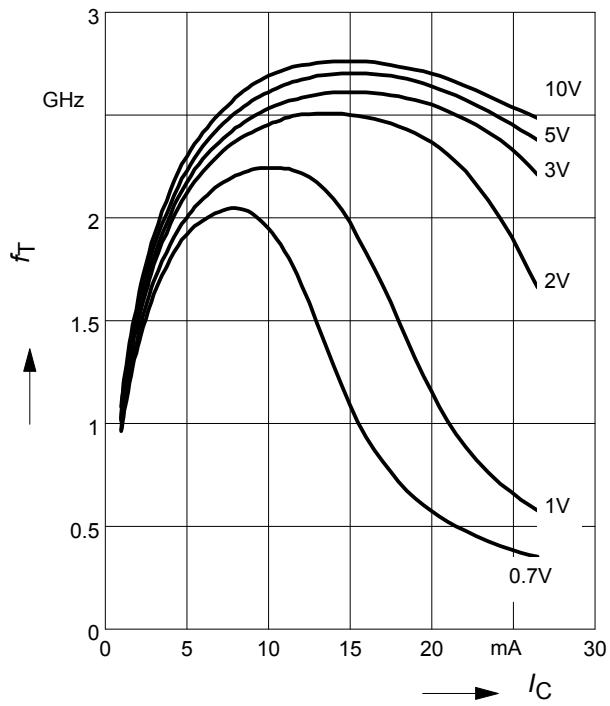
Emitter-base capacitance $C_{\text{eb}} = f(V_{\text{EB}})$

$f = 1 \text{ MHz}$



Transition frequency $f_T = f(I_C)$

V_{CE} = parameter



Package Outline

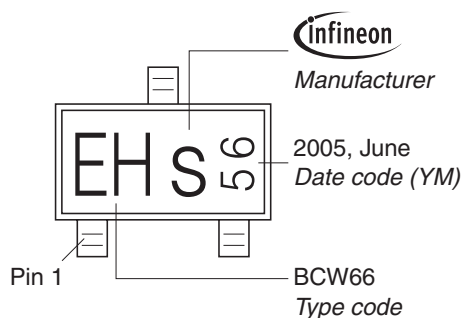


1) Lead width can be 0.6 max. in dambar area

Foot Print



Marking Layout (Example)



Standard Packing

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



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