

NPN Silicon AF Transistor

- For general AF applications
- High collector current
- High current gain
- Low collector-emitter saturation voltage
- Pb-free (RoHS compliant) package
- Qualified according AEC Q101



Type	Marking	Pin Configuration						Package
BC817K-16	6As	1 = B	2 = E	3 = C	-	-	-	SOT23
BC817K-16W	6As	1 = B	2 = E	3 = C	-	-	-	SOT323
BC817K-25	6Bs	1 = B	2 = E	3 = C	-	-	-	SOT23
BC817K-25W	6Bs	1 = B	2 = E	3 = C	-	-	-	SOT323
BC817K-40	6Cs	1 = B	2 = E	3 = C	-	-	-	SOT23
BC817K-40W	6Cs	1 = B	2 = E	3 = C	-	-	-	SOT323
BC818K-16W	6Es	1 = B	2 = E	3 = C	-	-	-	SOT323
BC818K-40	6Gs	1 = B	2 = E	3 = C	-	-	-	SOT23

Maximum Ratings

Parameter	Symbol	Value	Unit
Collector-emitter voltage BC817... BC818...	V_{CEO}	45 25	V
Collector-base voltage BC817... BC818...	V_{CBO}	50 30	
Emitter-base voltage	V_{EBO}	5	
Collector current	I_C	500	mA
Peak collector current	I_{CM}	1000	
Base current	I_B	100	
Peak base current	I_{BM}	200	
Total power dissipation- $T_S \leq 115\text{ °C}$, BC817K, BC818K $T_S \leq 130\text{ °C}$, BC817KW, BC818KW	P_{tot}	500 250	mW
Junction temperature	T_j	150	
Storage temperature	T_{stg}	-65 ... 150	°C

Thermal Resistance

Parameter	Symbol	Value	Unit
Junction - soldering point ¹⁾ BC817K, BC818K BC817KW, BC818KW	R_{thJS}	≤ 70 ≤ 80	K/W

¹⁾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 $I_C = 10\text{ mA}$, $I_B = 0$, BC817... $I_C = 10\text{ mA}$, $I_B = 0$, BC818...	$V_{(BR)CEO}$	45 25	- -	- -	V
Collector-base breakdown voltage $I_C = 10\text{ }\mu\text{A}$, $I_E = 0$, BC817... $I_C = 10\text{ }\mu\text{A}$, $I_E = 0$, BC818...	$V_{(BR)CBO}$	50 30	- -	- -	-
Emitter-base breakdown voltage $I_E = 10\text{ }\mu\text{A}$, $I_C = 0$	$V_{(BR)EBO}$	5	-	-	V
Collector-base cutoff current $V_{CB} = 25\text{ V}$, $I_E = 0$ $V_{CB} = 25\text{ V}$, $I_E = 0$, $T_A = 150\text{ }^{\circ}\text{C}$	I_{CBO}	- -	- -	0.1 50	μA
Emitter-base cutoff current $V_{EB} = 4\text{ V}$, $I_C = 0$	I_{EBO}	-	-	100	nA
DC current gain ¹⁾ $I_C = 100\text{ mA}$, $V_{CE} = 1\text{ V}$, $h_{FE}\text{-grp.16}$ $I_C = 100\text{ mA}$, $V_{CE} = 1\text{ V}$, $h_{FE}\text{-grp.25}$ $I_C = 100\text{ mA}$, $V_{CE} = 1\text{ V}$, $h_{FE}\text{-grp.40}$ $I_C = 500\text{ mA}$, $V_{CE} = 1\text{ V}$, all $h_{FE}\text{-grps.}$	h_{FE}	100 160 250 40	160 250 350 -	250 400 630 -	-
Collector-emitter saturation voltage ¹⁾ $I_C = 500\text{ mA}$, $I_B = 50\text{ mA}$	V_{CEsat}	-	-	0.7	V
Base emitter saturation voltage ¹⁾ $I_C = 500\text{ mA}$, $I_B = 50\text{ mA}$	V_{BEsat}	-	-	1.2	

¹⁾Pulse test: $t < 300\mu\text{s}$; $D < 2\%$

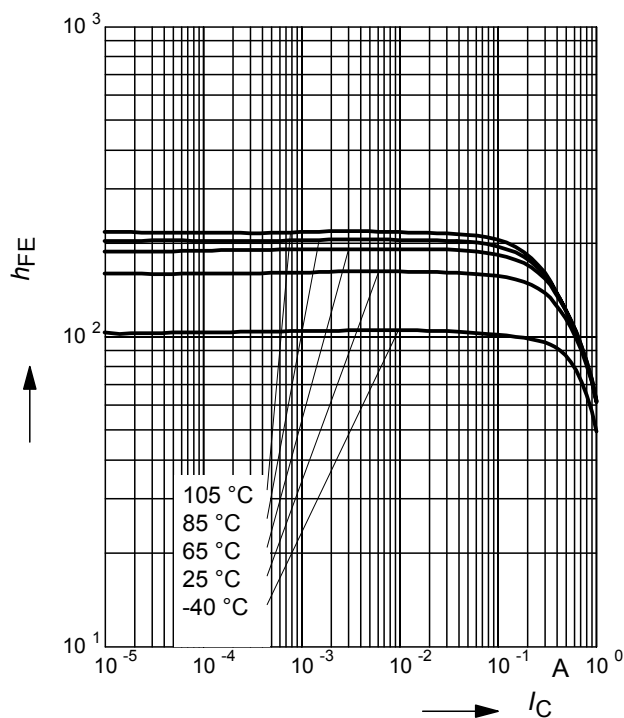
Electrical Characteristics at $T_A = 25^\circ\text{C}$, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
AC Characteristics					
Transition frequency $I_C = 50\text{ mA}$, $V_{CE} = 5\text{ V}$, $f = 100\text{ MHz}$	f_T	-	170	-	MHz
Collector-base capacitance $V_{CB} = 10\text{ V}$, $f = 1\text{ MHz}$	C_{cb}	-	3	-	pF
Emitter-base capacitance $V_{EB} = 0.5\text{ V}$, $f = 1\text{ MHz}$	C_{eb}	-	40	-	

DC current gain $h_{FE} = f(I_C)$

$V_{CE} = 1 \text{ V}$

$h_{FE}\text{-grp.16}$



DC current gain $h_{FE} = f(I_C)$

$V_{CE} = 1 \text{ V}$

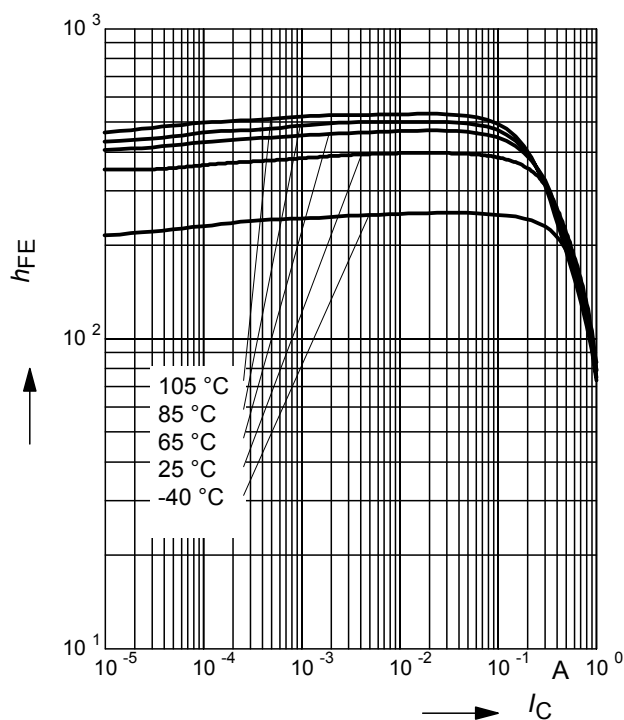
$h_{FE}\text{-grp.25}$



DC current gain $h_{FE} = f(I_C)$

$V_{CE} = 1 \text{ V}$

$h_{FE}\text{-grp.40}$



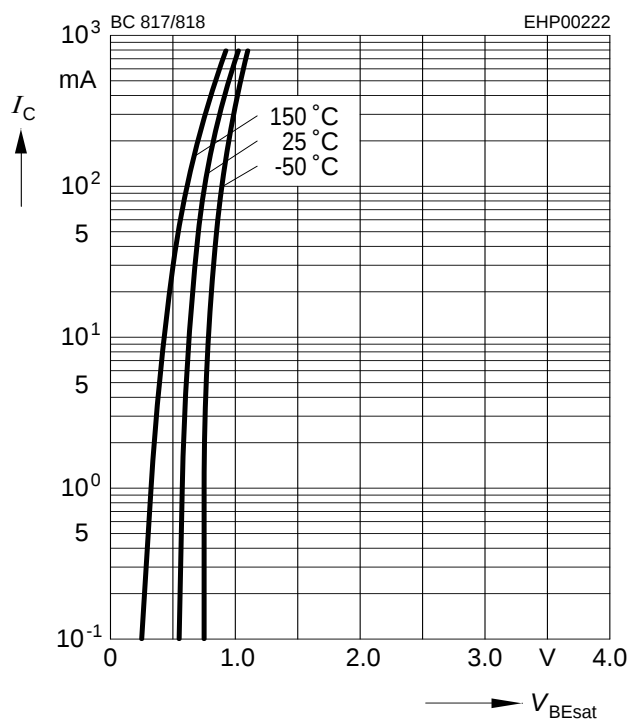
Collector-emitter saturation voltage

$I_C = f(V_{CEsat}), h_{FE} = 10$



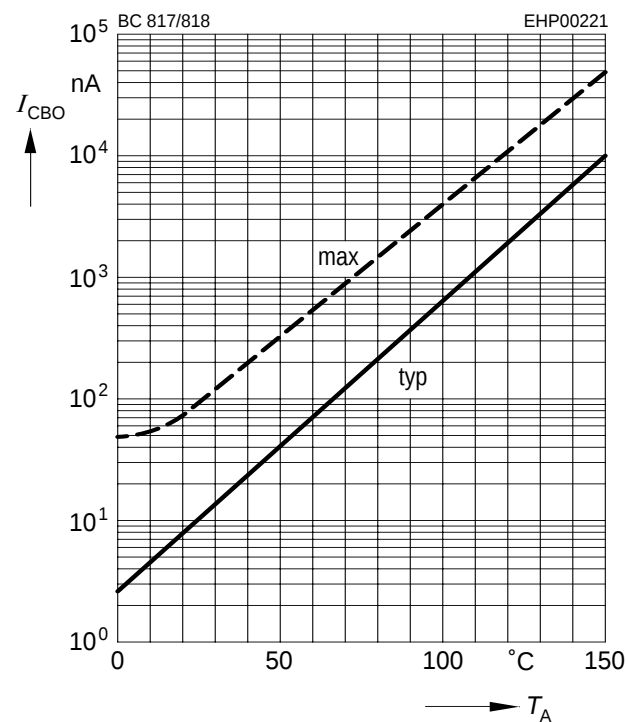
Base-emitter saturation voltage

$$I_C = f(V_{BEsat}), h_{FE} = 10$$



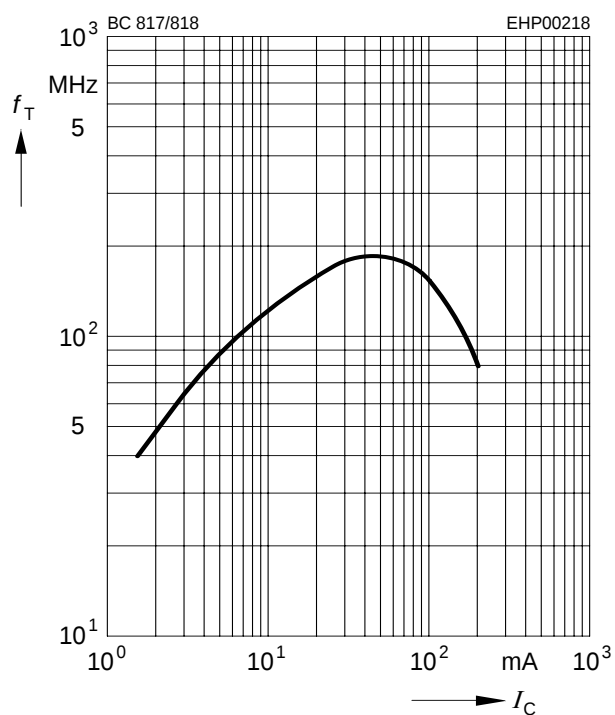
Collector cutoff current $I_{CBO} = f(T_A)$

$$V_{CBO} = 25 \text{ V}$$



Transition frequency $f_T = f(I_C)$

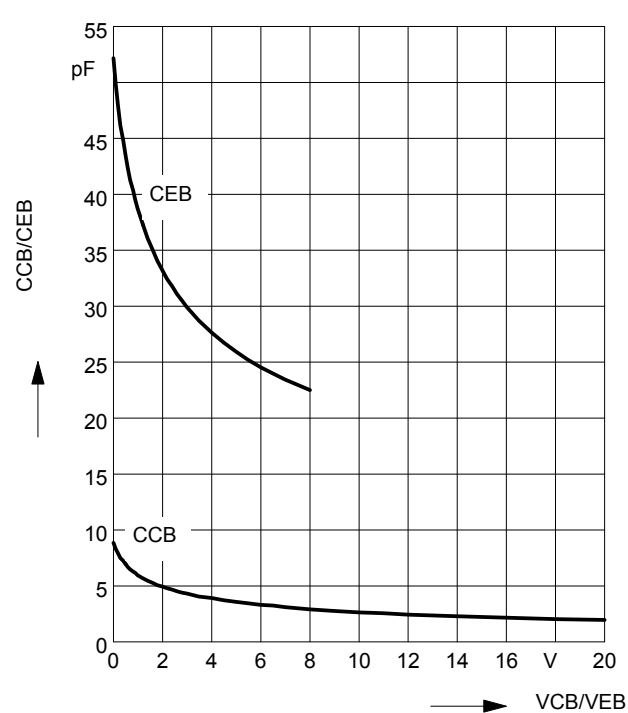
$$V_{CE} = \text{parameter in V}, f = 2 \text{ GHz}$$



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

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

BC817K, BC818K



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

BC817K, BC818K



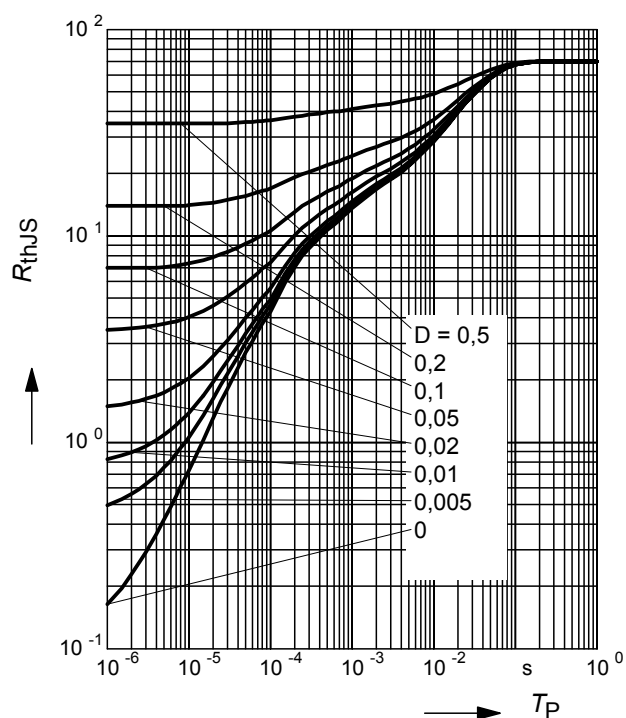
Total power dissipation $P_{\text{tot}} = f(T_S)$

BC817KW, BC818KW



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

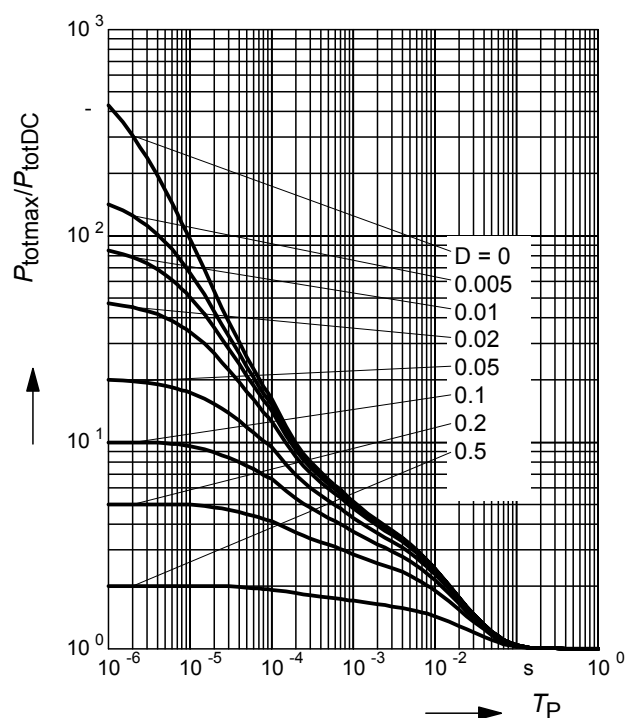
BC817K, BC818K



Permissible Pulse Load

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

BC817K, BC818K



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

BC817KW, BC818KW



Permissible Pulse Load

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

BC817KW, BC818KW

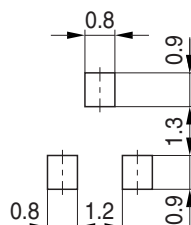


Package Outline

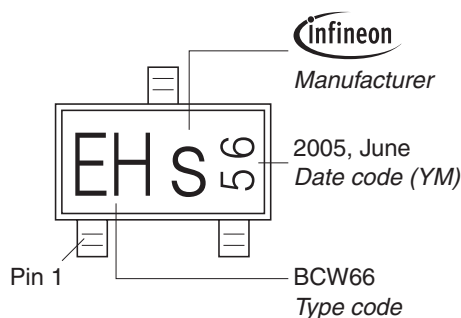


1) Lead width can be 0.6 max. in dambar area

Foot Print

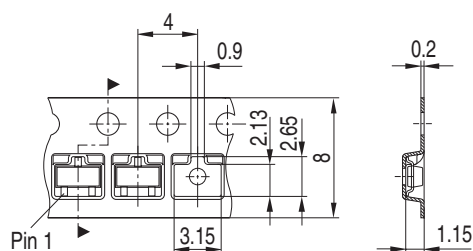


Marking Layout (Example)



Standard Packing

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



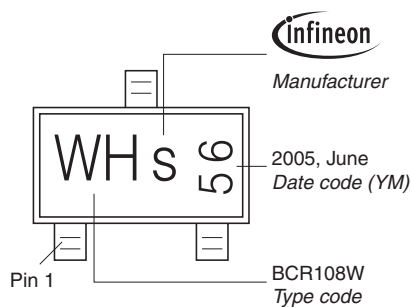
Package Outline



Foot Print



Marking Layout (Example)



Standard Packing

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



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