

NPN Silicon AF Transistors

- For general AF applications
- High current gain
- Low collector-emitter saturation voltage
- Complementary type: BCW68 (PNP)
- Pb-free (RoHS compliant) package
- Qualified according AEC Q101



Type	Marking	Pin Configuration			Package
BCW66KF	EFs	1=B	2=E	3=C	SOT23
BCW66KG	EGs	1=B	2=E	3=C	SOT23
BCW66KH	EHs	1=B	2=E	3=C	SOT23

Maximum Ratings

Parameter	Symbol	Value	Unit
Collector-emitter voltage	V_{CEO}	45	V
Collector-base voltage	V_{CBO}	75	
Emitter-base voltage	V_{EBO}	5	
Collector current	I_C	800	mA
Peak collector current, $t_p \leq 10$ ms	I_{CM}	1	A
Base current	I_B	100	mA
Peak base current	I_{BM}	200	
Total power dissipation- $T_S \leq 115$ °C	P_{tot}	500	mW
Junction temperature	T_j	150	°C
Storage temperature	T_{stg}	-65 ... 150	

Thermal Resistance

Parameter	Symbol	Value	Unit
Junction - soldering point ¹⁾	R_{thJS}	≤ 70	K/W

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 $I_C = 10\text{ mA}, I_B = 0$	$V_{(BR)CEO}$	45	-	-	V
Collector-base breakdown voltage $I_C = 10\text{ }\mu\text{A}, I_E = 0$	$V_{(BR)CBO}$	75	-	-	
Emitter-base breakdown voltage $I_E = 10\text{ }\mu\text{A}, I_C = 0$	$V_{(BR)EBO}$	5	-	-	
Collector-base cutoff current $V_{CB} = 45\text{ V}, I_E = 0$ $V_{CB} = 45\text{ V}, I_E = 0, T_A = 150\text{ }^\circ\text{C}$	I_{CBO}	- -	- -	0.02 20	μA
Emitter-base cutoff current $V_{EB} = 5\text{ V}, I_C = 0$	I_{EBO}	-	-	20	nA
DC current gain ²⁾ $I_C = 100\text{ }\mu\text{A} - 10\text{ mA}, V_{CE} = 1\text{ V}, \text{hFE-grp.F}$ $I_C = 100\text{ }\mu\text{A} - 10\text{ mA}, V_{CE} = 1\text{ V}, \text{hFE-grp.G}$ $I_C = 100\text{ }\mu\text{A} - 10\text{ mA}, V_{CE} = 1\text{ V}, \text{hFE-grp.H}$ $I_C = 100\text{ mA}, V_{CE} = 1\text{ V}, \text{hFE-grp.F}$ $I_C = 100\text{ mA}, V_{CE} = 1\text{ V}, \text{hFE-grp.G}$ $I_C = 100\text{ mA}, V_{CE} = 1\text{ V}, \text{hFE-grp.H}$ $I_C = 500\text{ mA}, V_{CE} = 1\text{ V}, \text{hFE-grp.F, G, H}$	h_{FE}	75 110 180 100 160 250 40	- - - 160 250 350 -	- - - 250 400 630 -	-
Collector-emitter saturation voltage ²⁾ $I_C = 100\text{ mA}, I_B = 10\text{ mA}$ $I_C = 500\text{ mA}, I_B = 50\text{ mA}$	V_{CEsat}	- -	- -	0.3 0.45	V
Base emitter saturation voltage ²⁾ $I_C = 100\text{ mA}, I_B = 10\text{ mA}$ $I_C = 500\text{ mA}, I_B = 50\text{ mA}$	V_{BEsat}	- -	- -	1.25 1.25	

¹For calculation of R_{thJA} please refer to Application Note AN077 (Thermal Resistance Calculation)

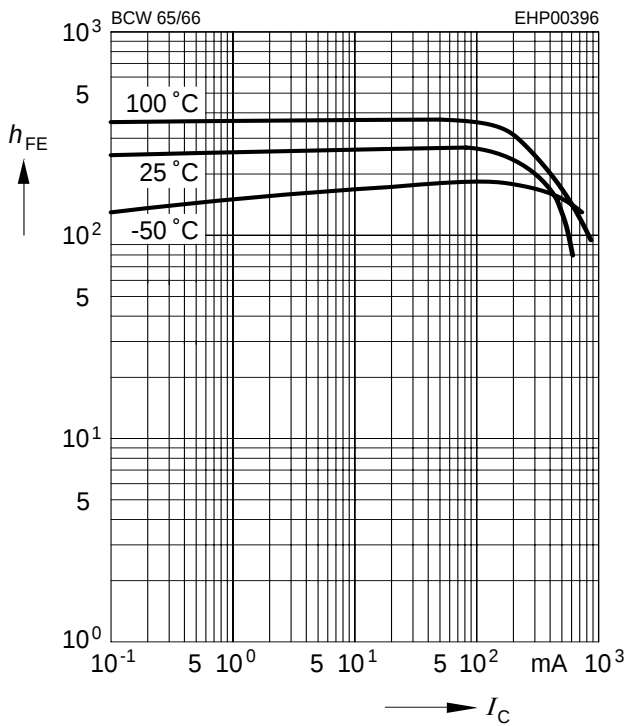
²Pulse test: $t < 300\mu\text{s}$; $D < 2\%$

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

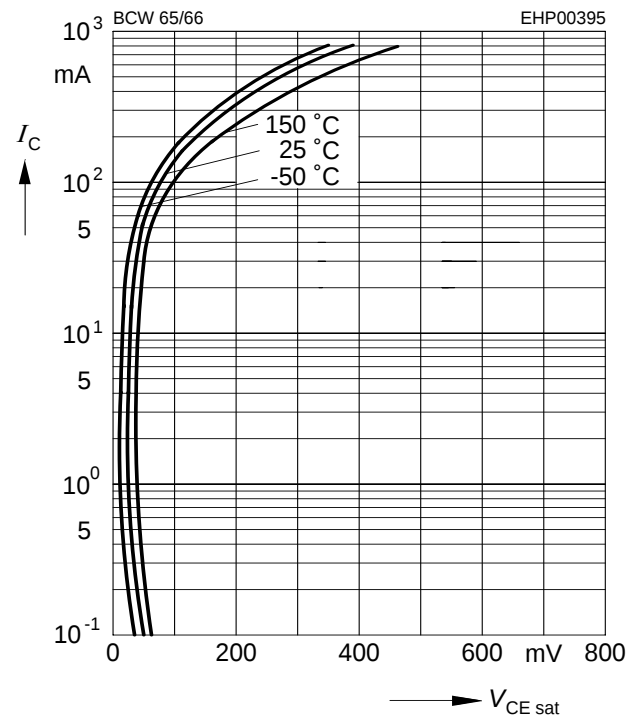
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
AC Characteristics					
Transition frequency $I_C = 50\text{ mA}$, $V_{CE} = 5\text{ V}$, $f = 20\text{ MHz}$	f_T	-	170	-	MHz
Collector-base capacitance $V_{CB} = 10\text{ V}$, $f = 1\text{ MHz}$	C_{cb}	-	3	-	pF
Emitter-base capacitance $V_{EB} = 0.5\text{ V}$, $f = 1\text{ MHz}$	C_{eb}	-	40	-	

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

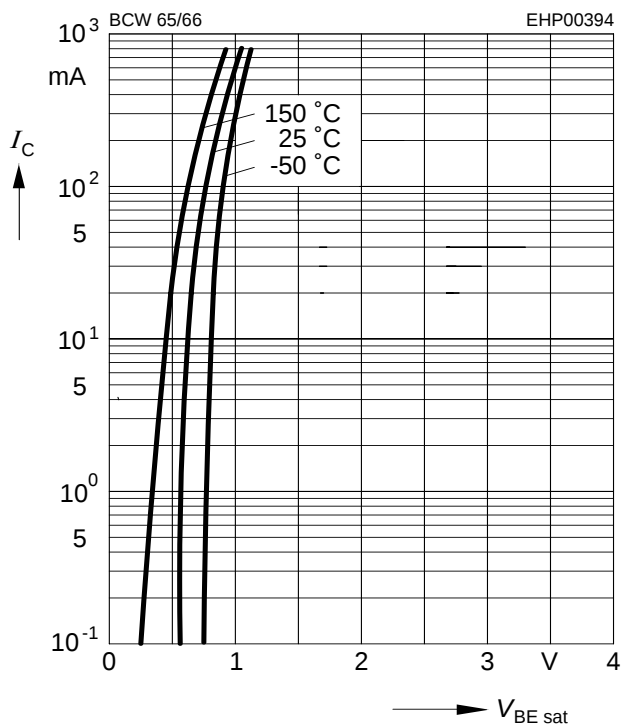
$$V_{CE} = 1 \text{ V}$$


Collector-emitter saturation voltage

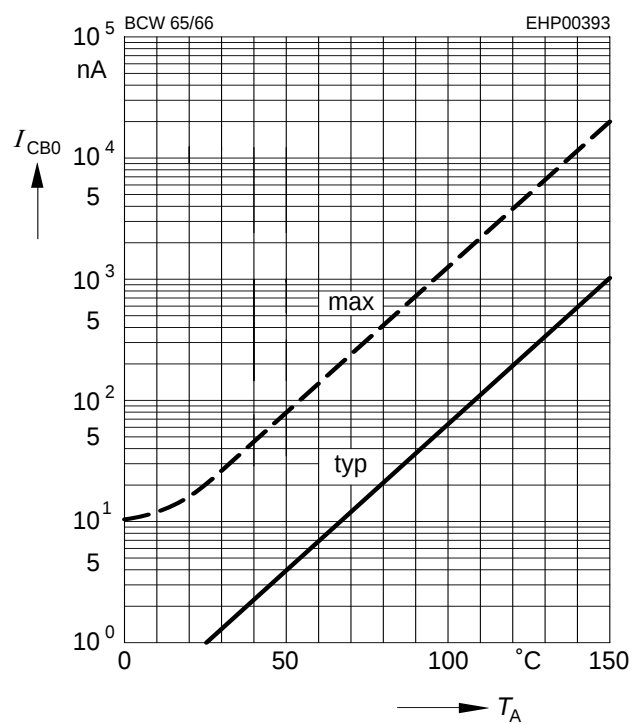
$$I_C = f(V_{CEsat}), h_{FE} = 10$$


Base-emitter saturation voltage

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

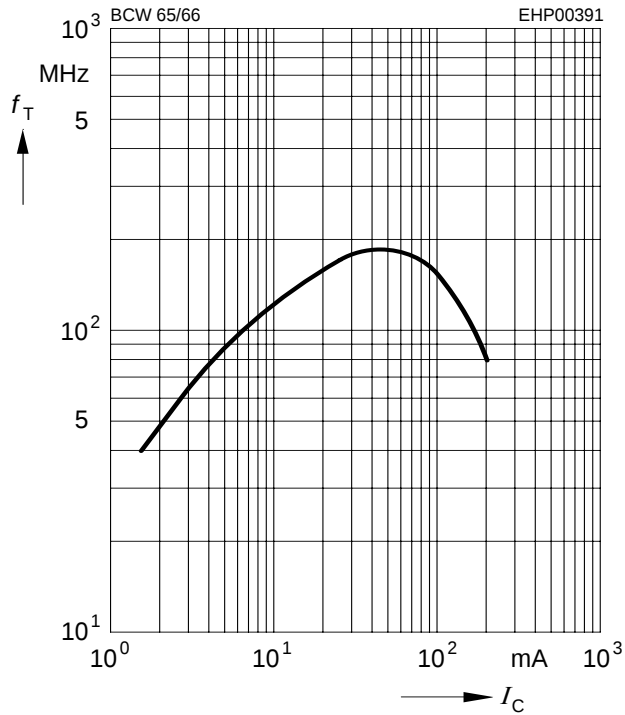

Collector cutoff current $I_{CBO} = f(T_A)$

$$V_{CB} = V_{CEmax}$$



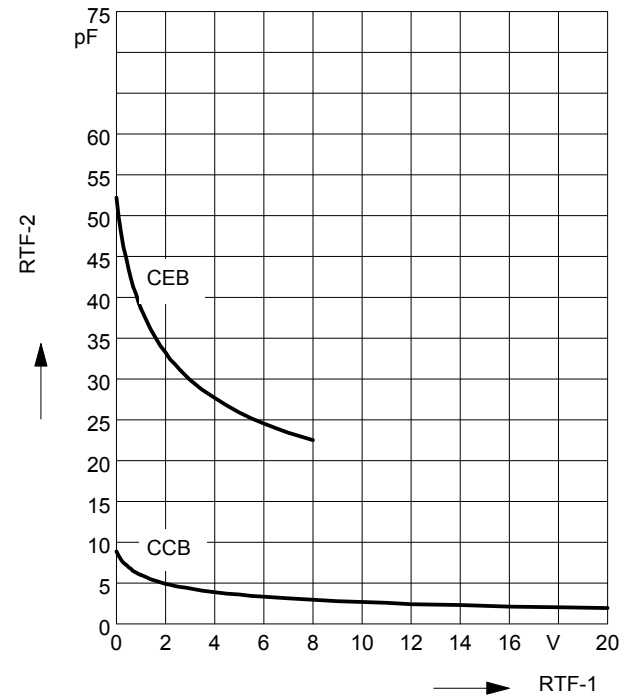
Transition frequency $f_T = f(I_C)$

$V_{CE} = 5 \text{ V}$

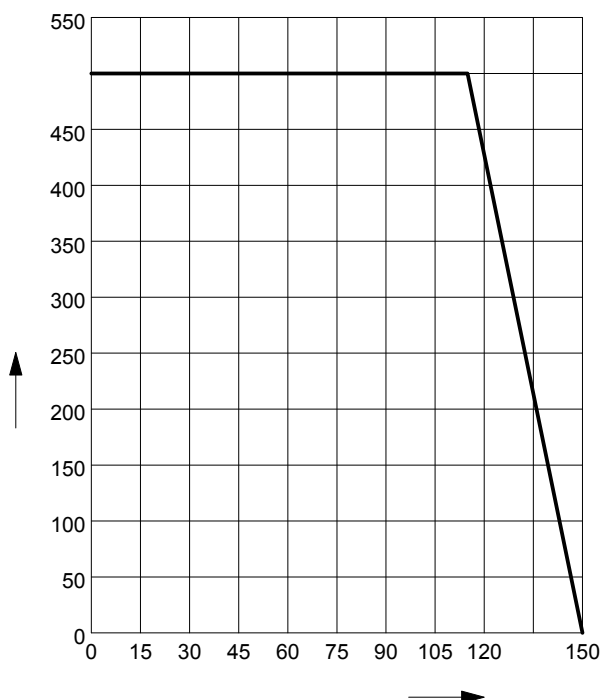


Collector-base capacitance $C_{cb} = f(V_{CB})$

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

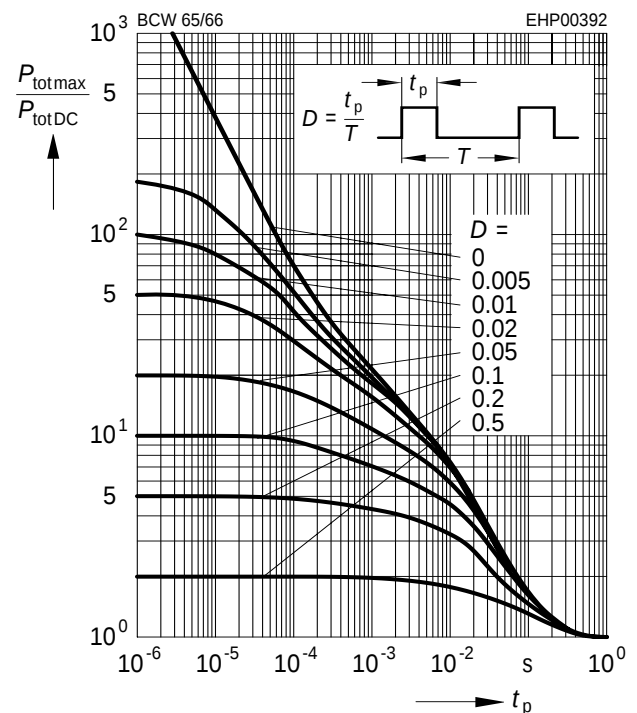


Total power dissipation $P_{tot} = f(T_S)$



Permissible Pulse Load

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

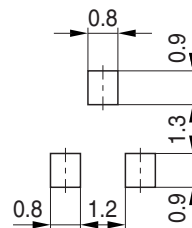


Package Outline



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

Foot Print

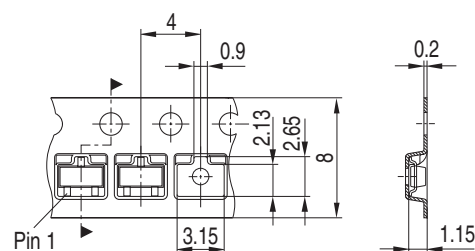


Marking Layout (Example)



Standard Packing

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



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