

**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
		1=B	2=E	3=C	
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 <sup>1)</sup>	$R_{thJS}$	$\leq 70$	K/W

**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 $I_C = 10\text{ mA}, I_B = 0$	$V_{(BR)CEO}$	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	$\mu\text{A}$
Emitter-base cutoff current $V_{EB} = 5\text{ V}, I_C = 0$	$I_{EBO}$	-	-	20	nA
DC current gain <sup>2)</sup> $I_C = 100\text{ }\mu\text{A} - 10\text{ mA}, V_{CE} = 1\text{ V}, \text{hFE-grp.F}$ $I_C = 100\text{ }\mu\text{A} - 10\text{ mA}, V_{CE} = 1\text{ V}, \text{hFE-grp.G}$ $I_C = 100\text{ }\mu\text{A} - 10\text{ mA}, V_{CE} = 1\text{ V}, \text{hFE-grp.H}$ $I_C = 100\text{ mA}, V_{CE} = 1\text{ V}, \text{hFE-grp.F}$ $I_C = 100\text{ mA}, V_{CE} = 1\text{ V}, \text{hFE-grp.G}$ $I_C = 100\text{ mA}, V_{CE} = 1\text{ V}, \text{hFE-grp.H}$ $I_C = 500\text{ mA}, V_{CE} = 1\text{ V}, \text{hFE-grp.F, G, H}$	$h_{FE}$	75 110 180 100 160 250 40	- - - 160 250 350 -	- - - 250 400 630 -	-
Collector-emitter saturation voltage <sup>2)</sup> $I_C = 100\text{ mA}, I_B = 10\text{ mA}$ $I_C = 500\text{ mA}, I_B = 50\text{ mA}$	$V_{CEsat}$	- -	- -	0.3 0.45	V
Base emitter saturation voltage <sup>2)</sup> $I_C = 100\text{ mA}, I_B = 10\text{ mA}$ $I_C = 500\text{ mA}, I_B = 50\text{ mA}$	$V_{BEsat}$	- -	- -	1.25 1.25	

<sup>1</sup>For calculation of  $R_{thJA}$  please refer to Application Note AN077 (Thermal Resistance Calculation)

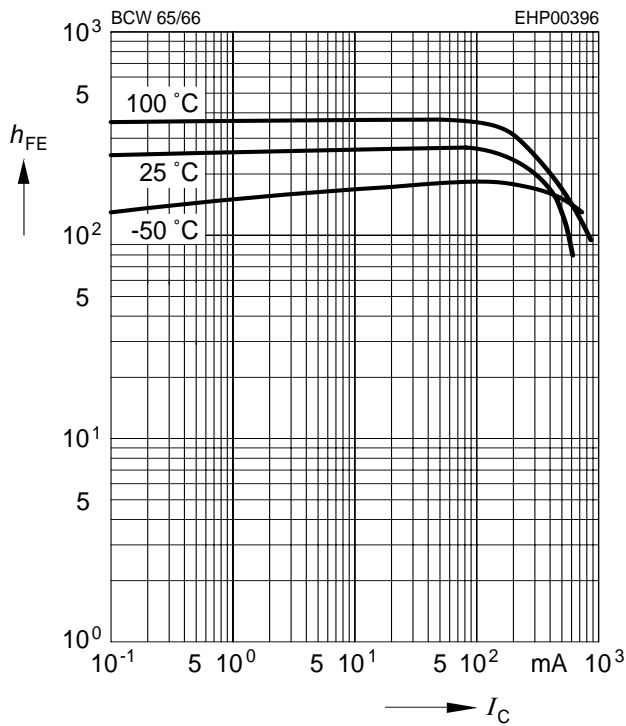
<sup>2</sup>Pulse test:  $t < 300\text{ }\mu\text{s}; D < 2\%$

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

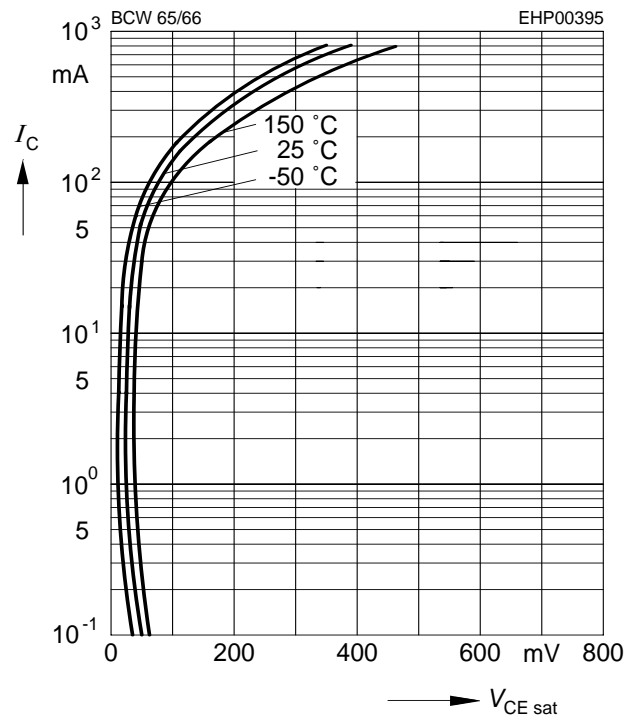
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
<b>AC Characteristics</b>					
Transition frequency $I_C = 50 \text{ mA}$ , $V_{CE} = 5 \text{ V}$ , $f = 20 \text{ MHz}$	$f_T$	-	170	-	MHz
Collector-base capacitance $V_{CB} = 10 \text{ V}$ , $f = 1 \text{ MHz}$	$C_{cb}$	-	3	-	pF
Emitter-base capacitance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

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

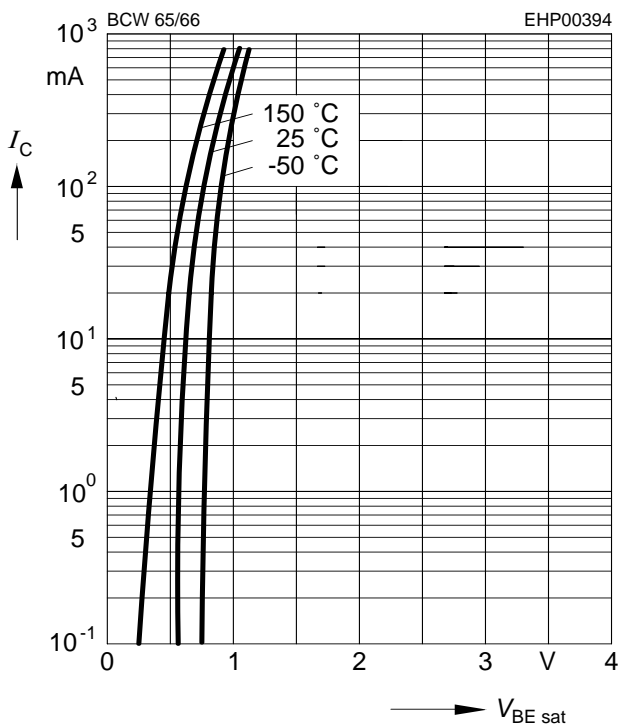
$V_{CE} = 1 \text{ V}$


**Collector-emitter saturation voltage**

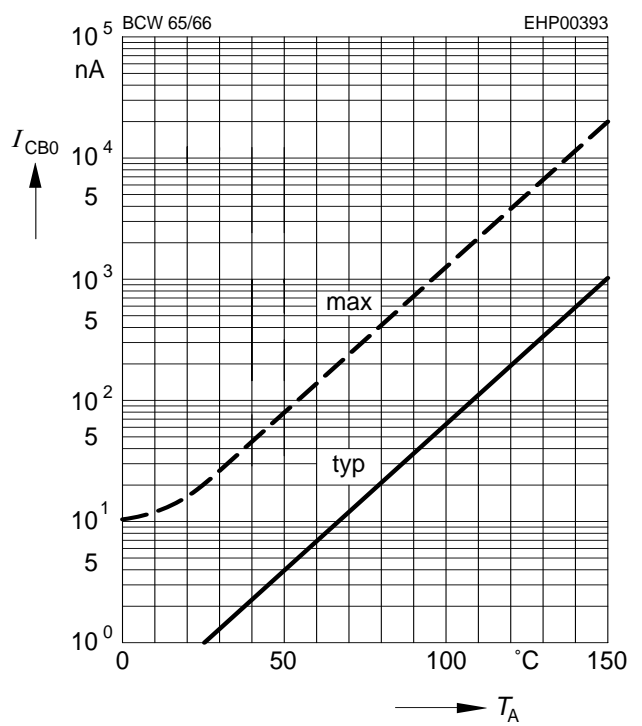
$I_C = f(V_{CEsat}), h_{FE} = 10$


**Base-emitter saturation voltage**

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

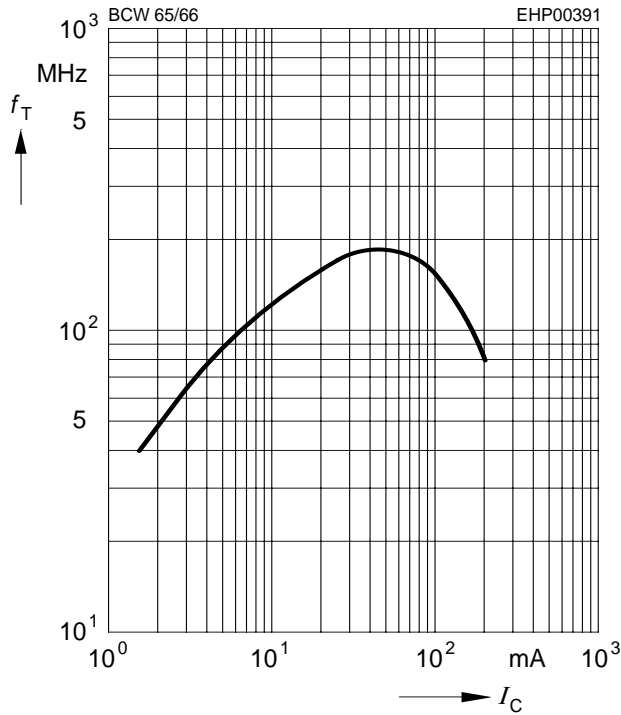

**Collector cutoff current  $I_{CBO} = f(T_A)$** 

$V_{CB} = V_{CEmax}$



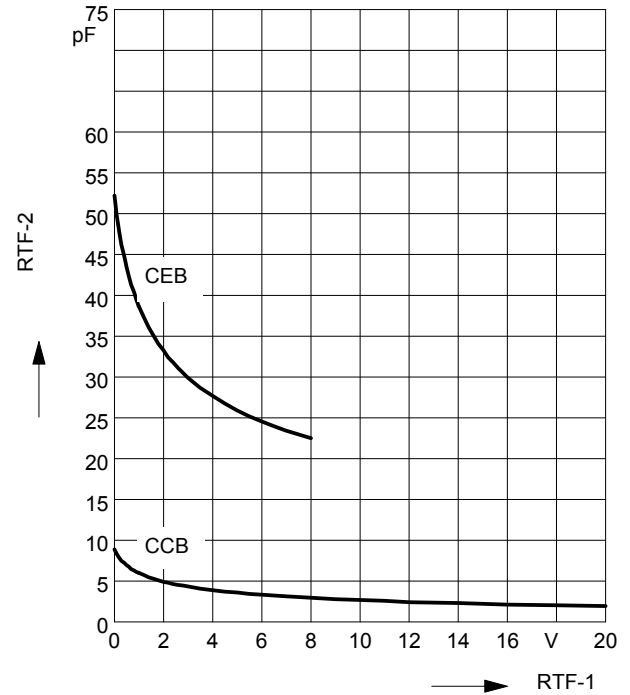
Transition frequency  $f_T = f(I_C)$

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

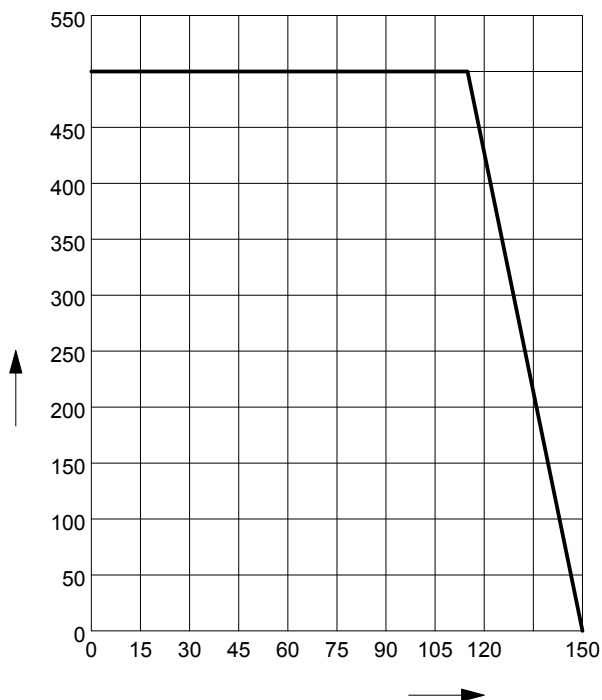


Collector-base capacitance  $C_{cb} = f(V_{CB})$

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

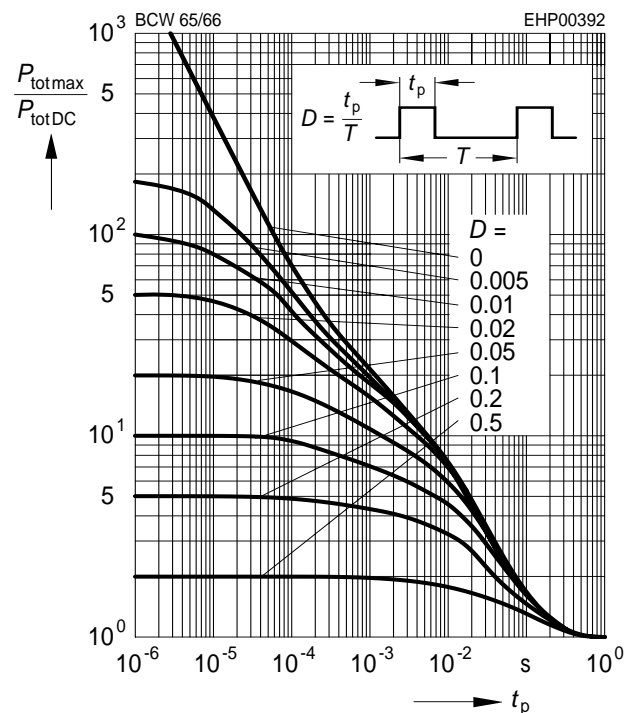


Total power dissipation  $P_{tot} = f(T_S)$



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



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