

**NPN Silicon AF Transistors**

- For AF driver and output stages
- High collector current
- Low collector-emitter saturation voltage
- Complementary types: BCP51...BCP53 (PNP)
- Pb-free (RoHS compliant) package
- Qualified according AEC Q101



Type	Marking	Pin Configuration						Package
		1=B	2=C	3=E	4=C	-	-	
BCP54	*	1=B	2=C	3=E	4=C	-	-	SOT223
BCP54-16	*	1=B	2=C	3=E	4=C	-	-	SOT223
BCP55	*	1=B	2=C	3=E	4=C	-	-	SOT223
BCP55-16	*	1=B	2=C	3=E	4=C	-	-	SOT223
BCP56-10	*	1=B	2=C	3=E	4=C	-	-	SOT223
BCP56-16	*	1=B	2=C	3=E	4=C	-	-	SOT223

\* Marking is the same as the type-name

**Maximum Ratings**

Parameter	Symbol	Value	Unit
Collector-emitter voltage	$V_{CEO}$		V
BCP54		45	
BCP55		60	
BCP56		80	
Collector-base voltage	$V_{CBO}$		
BCP54		45	
BCP55		60	
BCP56		100	
Emitter-base voltage	$V_{EBO}$	5	
Collector current	$I_C$	1	A
Peak collector current, $t_p \leq 10$ ms	$I_{CM}$	1.5	
Base current	$I_B$	100	mA
Peak base current	$I_{BM}$	200	
Total power dissipation- $T_S \leq 120^\circ\text{C}$	$P_{tot}$	2	W
Junction temperature	$T_j$	150	$^\circ\text{C}$
Storage temperature	$T_{stg}$	-65 ... 150	

**Thermal Resistance**

Parameter	Symbol	Value	Unit
Junction - soldering point <sup>1)</sup>	$R_{thJS}$	$\leq 15$	K/W

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

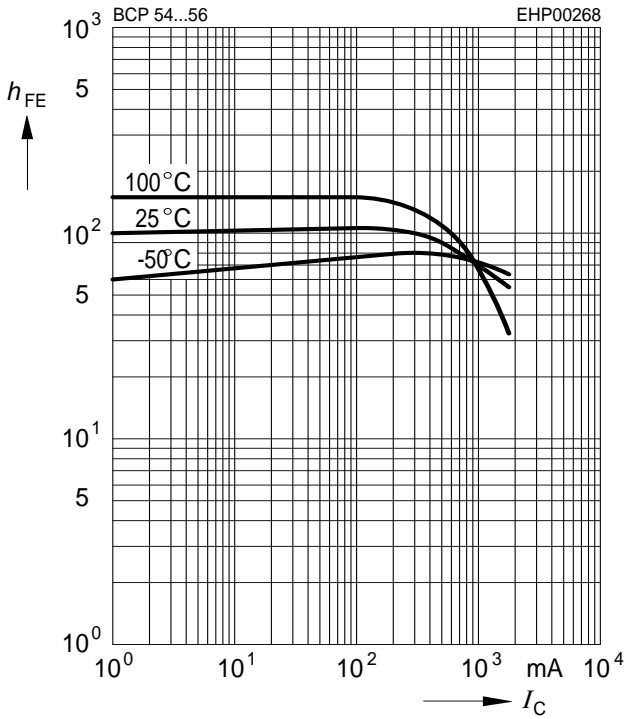
**Electrical Characteristics at  $T_A = 25^\circ\text{C}$ , unless otherwise specified**

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
<b>DC Characteristics</b>					
Collector-emitter breakdown voltage $I_C = 10\text{ mA}$ , $I_B = 0$ , BCP54... $I_C = 10\text{ mA}$ , $I_B = 0$ , BCP55... $I_C = 10\text{ mA}$ , $I_B = 0$ , BCP56-10, -16	$V_{(BR)CEO}$	45 60 80	- - -	- - -	V
Collector-base breakdown voltage $I_C = 100\text{ }\mu\text{A}$ , $I_E = 0$ , BCP54... $I_C = 100\text{ }\mu\text{A}$ , $I_E = 0$ , BCP55... $I_C = 100\text{ }\mu\text{A}$ , $I_E = 0$ , BCP56-10, -16	$V_{(BR)CBO}$	45 60 100	- - -	- - -	
Emitter-base breakdown voltage $I_E = 10\text{ }\mu\text{A}$ , $I_C = 0$	$V_{(BR)EBO}$	5	-	-	
Collector-base cutoff current $V_{CB} = 30\text{ V}$ , $I_E = 0$ $V_{CB} = 30\text{ V}$ , $I_E = 0$ , $T_A = 150\text{ }^\circ\text{C}$	$I_{CBO}$	- -	- -	0.1 20	$\mu\text{A}$
DC current gain <sup>1)</sup> $I_C = 5\text{ mA}$ , $V_{CE} = 2\text{ V}$ $I_C = 150\text{ mA}$ , $V_{CE} = 2\text{ V}$ , BCP54/BCP55 $I_C = 150\text{ mA}$ , $V_{CE} = 2\text{ V}$ , BCP56-10 $I_C = 150\text{ mA}$ , $V_{CE} = 2\text{ V}$ , BCP54-16...BCP56-16 $I_C = 500\text{ mA}$ , $V_{CE} = 2\text{ V}$	$h_{FE}$	25 40 63 100 25	- - 100 160 -	- 250 160 250 -	-
Collector-emitter saturation voltage <sup>1)</sup> $I_C = 500\text{ mA}$ , $I_B = 50\text{ mA}$	$V_{CEsat}$	-	-	0.5	V
Base-emitter voltage <sup>1)</sup> $I_C = 500\text{ mA}$ , $V_{CE} = 2\text{ V}$	$V_{BE(ON)}$	-	-	1	
<b>AC Characteristics</b>					
Transition frequency $I_C = 50\text{ mA}$ , $V_{CE} = 10\text{ V}$ , $f = 100\text{ MHz}$	$f_T$	-	100	-	MHz

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

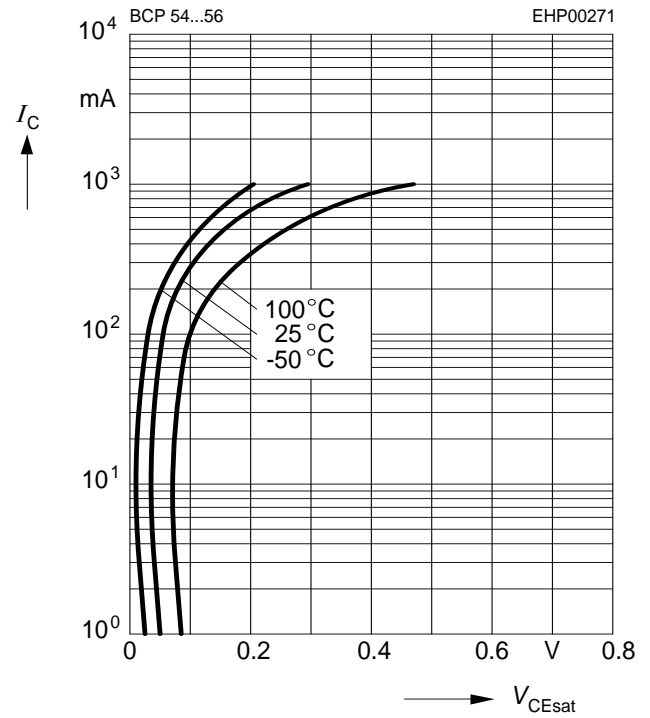
**DC current gain  $h_{FE} = f(I_C)$**

$V_{CE} = 2\text{ V}$



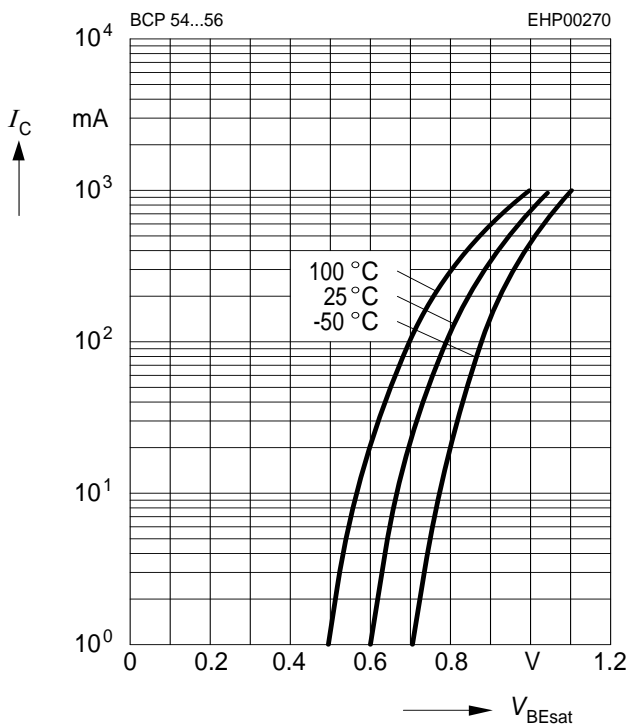
**Collector-emitter saturation voltage**

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



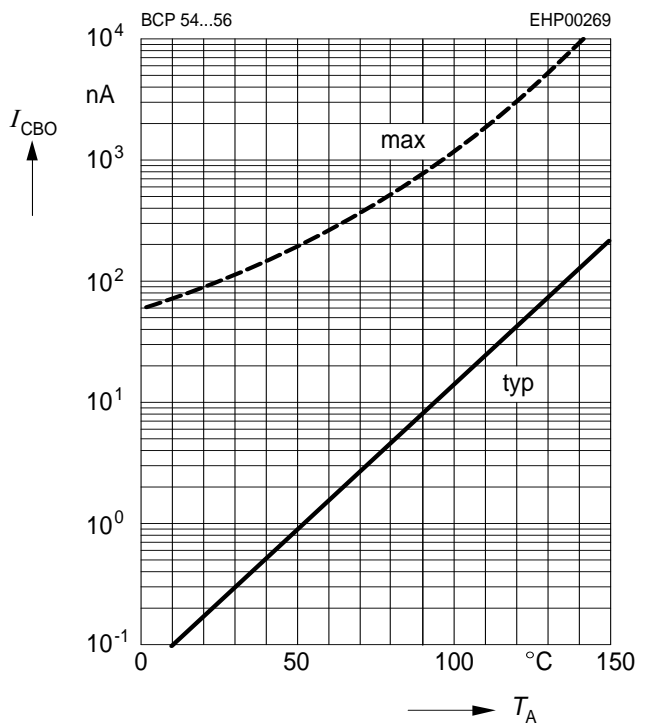
**Base-emitter saturation voltage**

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



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

$V_{CBO} = 30\text{ V}$



Transition frequency  $f_T = f(I_C)$

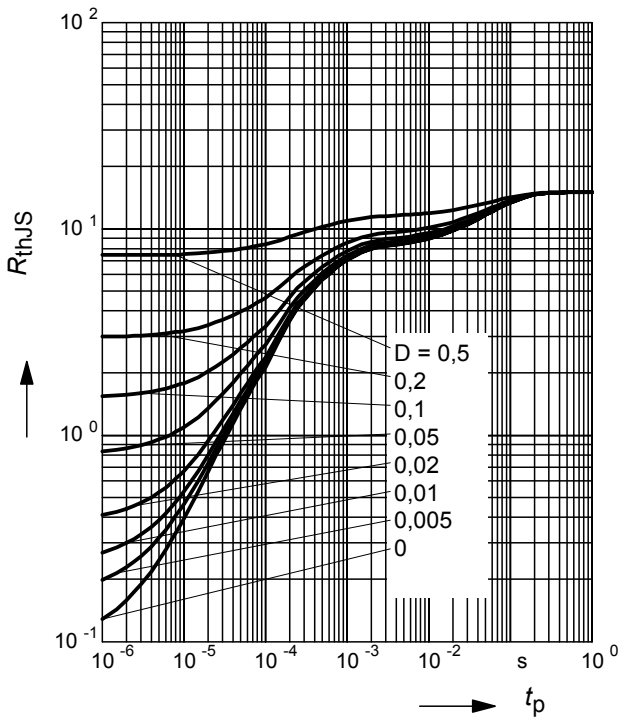
$V_{CE} = 10\text{ V}$



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

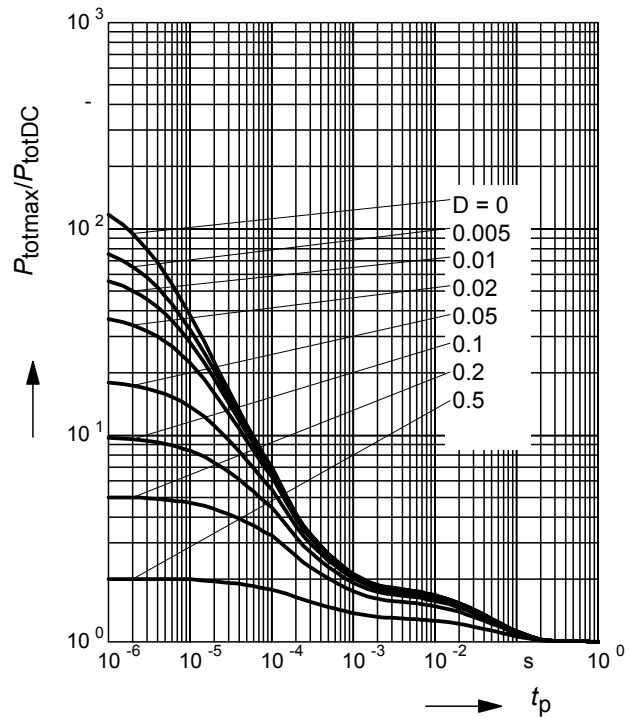


Permissible Pulse Load  $R_{thJS} = f(t_p)$

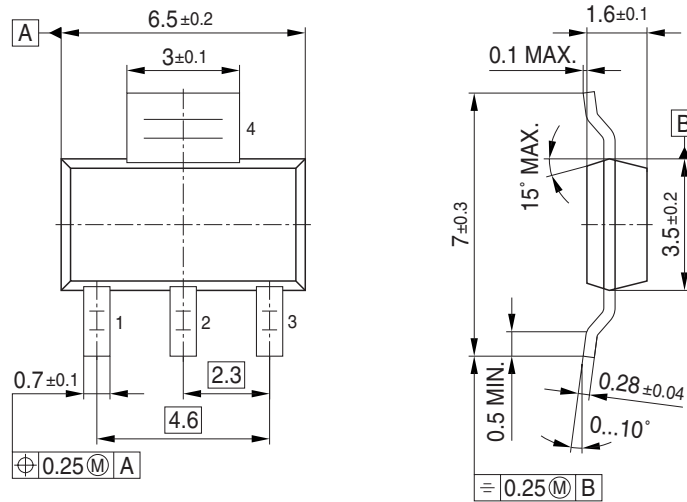


Permissible Pulse Load

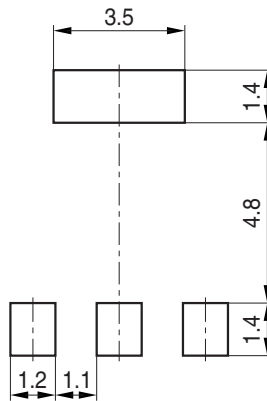
$P_{totmax}/P_{totDC} = f(t_p)$



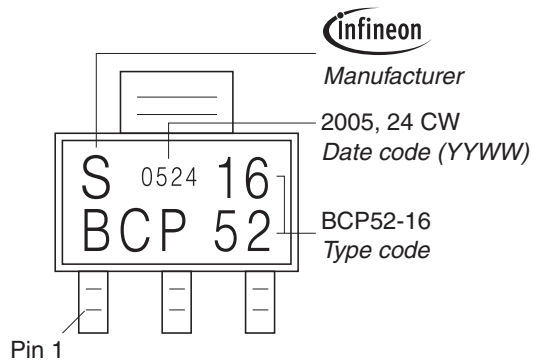
Package Outline



Foot Print

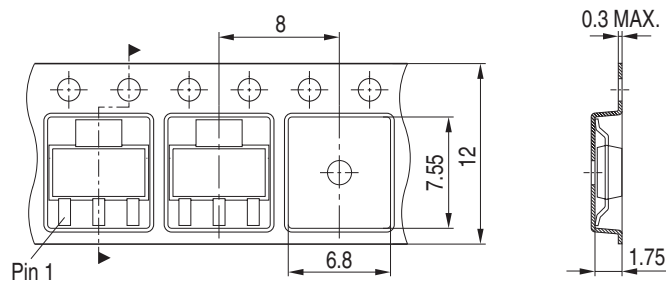


Marking Layout (Example)



Packing

Reel  $\varnothing 180$  mm = 1.000 Pieces/Reel  
 Reel  $\varnothing 330$  mm = 4.000 Pieces/Reel



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