

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 ¹⁾	R_{thJS}	≤ 15	K/W

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

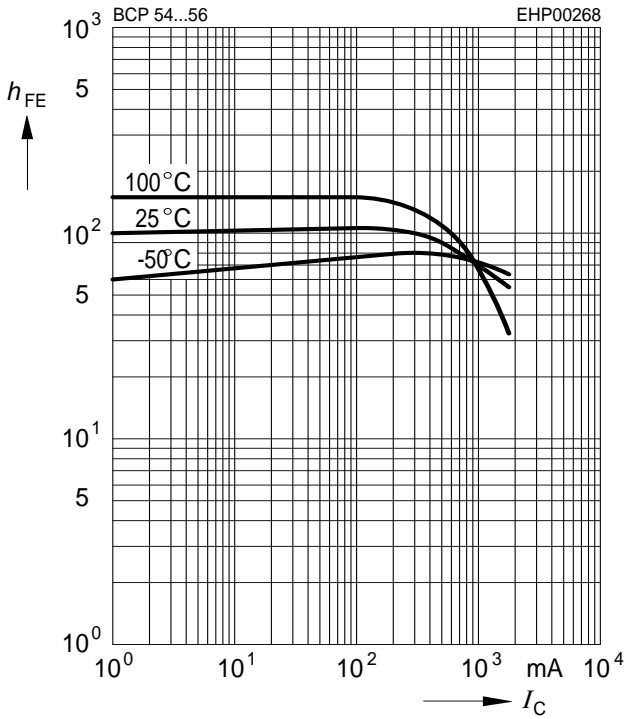
Electrical Characteristics at $T_A = 25^\circ\text{C}$, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
DC Characteristics					
Collector-emitter breakdown voltage $I_C = 10\text{ mA}$, $I_B = 0$, 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	μA
DC current gain ¹⁾ $I_C = 5\text{ mA}$, $V_{CE} = 2\text{ V}$ $I_C = 150\text{ mA}$, $V_{CE} = 2\text{ V}$, 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 ¹⁾ $I_C = 500\text{ mA}$, $I_B = 50\text{ mA}$	V_{CEsat}	-	-	0.5	V
Base-emitter voltage ¹⁾ $I_C = 500\text{ mA}$, $V_{CE} = 2\text{ V}$	$V_{BE(ON)}$	-	-	1	
AC Characteristics					
Transition frequency $I_C = 50\text{ mA}$, $V_{CE} = 10\text{ V}$, $f = 100\text{ MHz}$	f_T	-	100	-	MHz

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

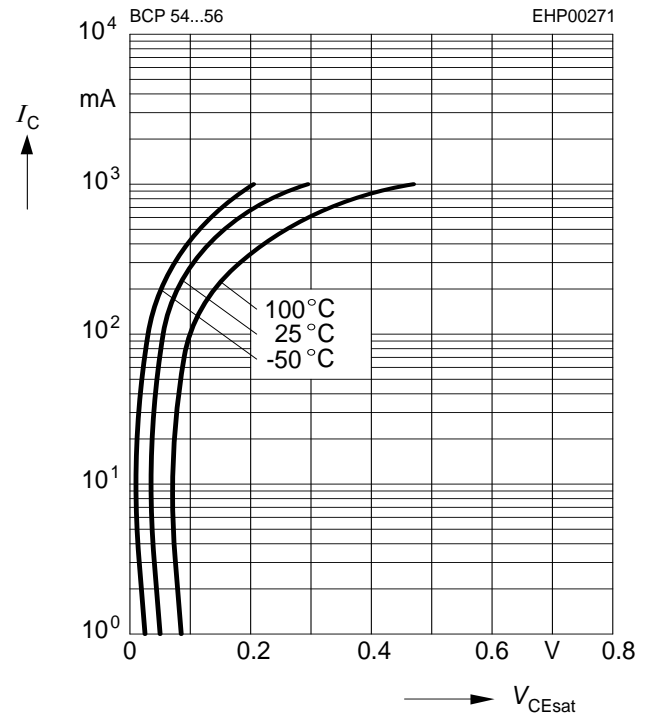
DC current gain $h_{FE} = f(I_C)$

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



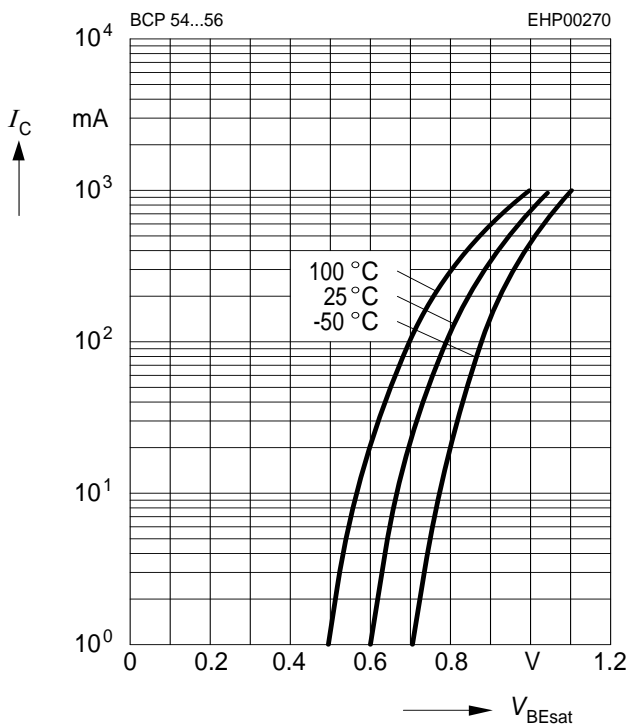
Collector-emitter saturation voltage

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



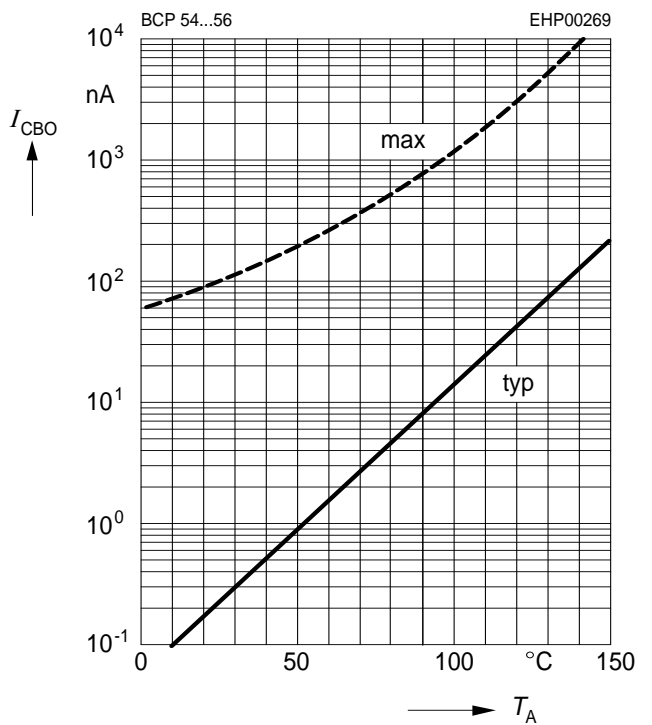
Base-emitter saturation voltage

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



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

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



Transition frequency $f_T = f(I_C)$

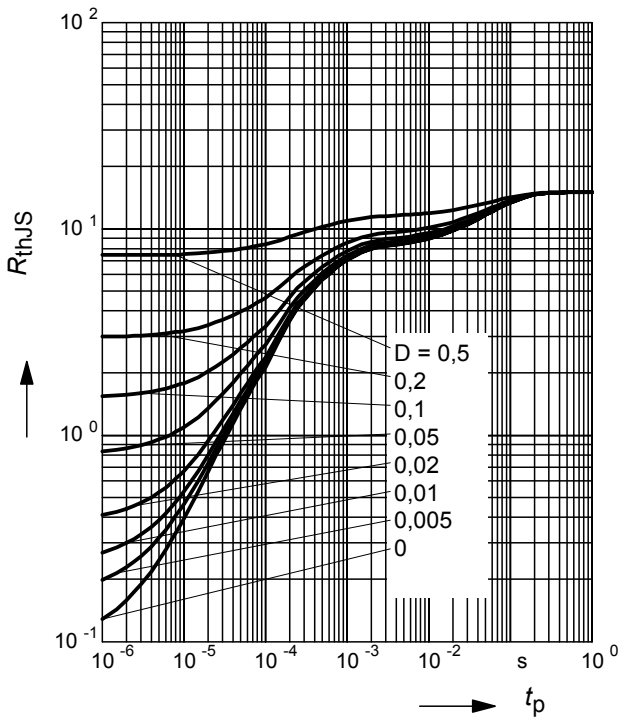
$V_{CE} = 10\text{ V}$



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

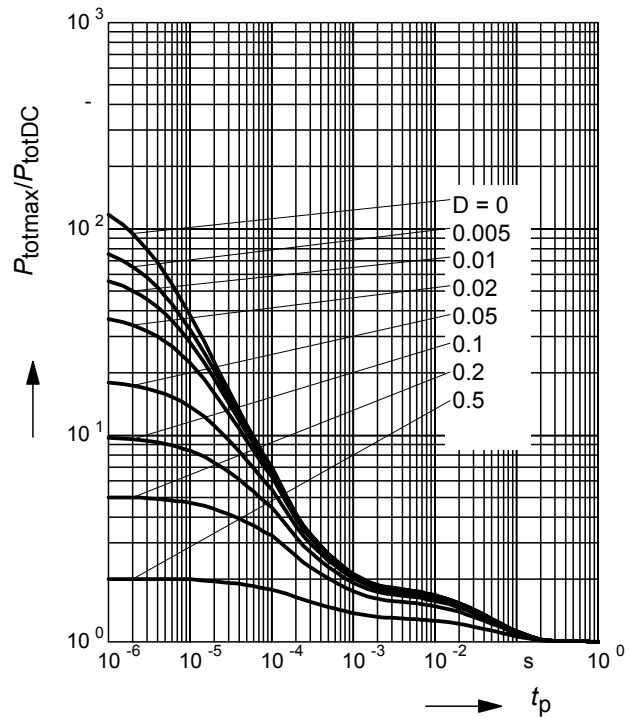


Permissible Pulse Load $R_{thJS} = f(t_p)$

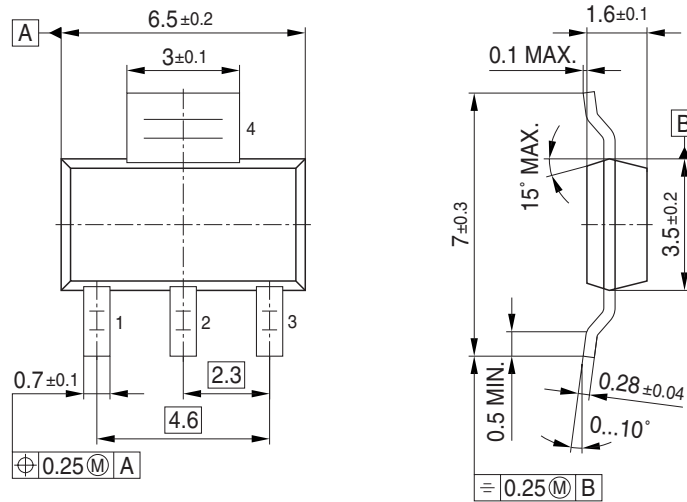


Permissible Pulse Load

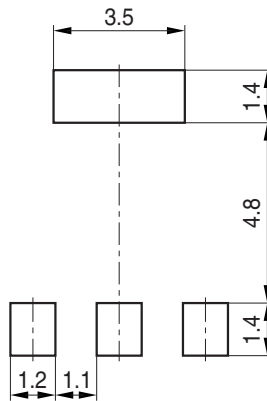
$P_{totmax}/P_{totDC} = f(t_p)$



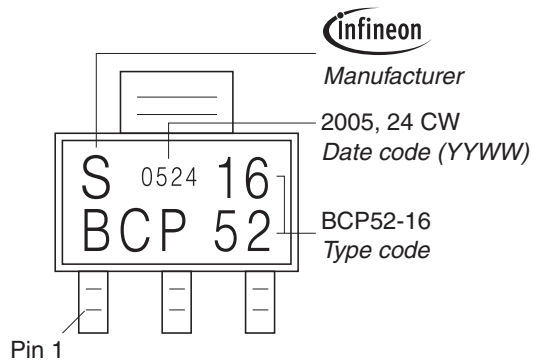
Package Outline



Foot Print

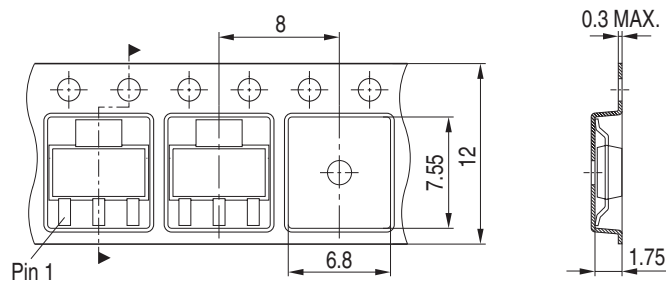


Marking Layout (Example)



Packing

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



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