

Silicon NPN Transistors

- For AF driver and output stages
- High collector current
- High current gain
- Low collector-emitter saturation voltage
- Complementary types: BDP948, BDP950, BDP954 (PNP)
- Pb-free (RoHS compliant) package
- Qualified according AEC Q101



Type	Marking	Pin Configuration						Package
		1=B	2=C	3=E	4=C	-	-	
BDP947	BDP947	1=B	2=C	3=E	4=C	-	-	SOT223
BDP949	BDP949	1=B	2=C	3=E	4=C	-	-	SOT223
BDP953	BDP953	1=B	2=C	3=E	4=C	-	-	SOT223

Maximum Ratings

Parameter	Symbol	Value	Unit
Collector-emitter voltage	V_{CEO}		V
BDP947		45	
BDP949		60	
BDP953		100	
Collector-base voltage	V_{CBO}		
BDP947		45	
BDP949		60	
BDP953		120	
Emitter-base voltage	V_{EBO}	5	
Collector current	I_C	3	A
Peak collector current, $t_p \leq 10$ ms	I_{CM}	5	
Base current	I_B	200	mA
Peak base current, $t_p \leq 10$ ms	I_{BM}	500	
Total power dissipation- $T_S \leq 100$ °C	P_{tot}	5	W
Junction temperature	T_j	150	°C
Storage temperature	T_{stg}	-65 ... 150	

Thermal Resistance

Parameter	Symbol	Value	Unit
Junction - soldering point ¹⁾	R_{thJS}	≤ 10	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 $I_C = 10\text{ mA}$, $I_B = 0$, BDP947 $I_C = 10\text{ mA}$, $I_B = 0$, BDP949 $I_C = 10\text{ mA}$, $I_B = 0$, BDP953	$V_{(BR)CEO}$	45 60 100	- - -	- - -	V
Collector-base breakdown voltage $I_C = 100\text{ }\mu\text{A}$, $I_E = 0$, BDP947 $I_C = 100\text{ }\mu\text{A}$, $I_E = 0$, BDP949 $I_C = 0$, $I_E = 100\text{ }\mu\text{A}$, BDP953	$V_{(BR)CBO}$	45 60 120	- - -	- - -	
Emitter-base breakdown voltage $I_E = 10\text{ }\mu\text{A}$, $I_C = 0$	$V_{(BR)EBO}$	5	-	-	
Collector-base cutoff current $V_{CB} = 45\text{ V}$, $I_E = 0$ $V_{CB} = 45\text{ V}$, $I_E = 0$, $T_A = 150^\circ\text{C}$	I_{CBO}	- -	- -	0.1 20	μA
Emitter-base cutoff current $V_{EB} = 4\text{ V}$, $I_C = 0$	I_{EBO}	-	-	100	nA
DC current gain ²⁾ $I_C = 10\text{ mA}$, $V_{CE} = 5\text{ V}$ $I_C = 500\text{ mA}$, $V_{CE} = 1\text{ V}$ $I_C = 2\text{ A}$, $V_{CE} = 2\text{ V}$, BDP947, BDP949 $I_C = 2\text{ A}$, $V_{CE} = 2\text{ V}$, BDP953	h_{FE}	25 100 50 15	- - - -	- 475 - -	-
Collector-emitter saturation voltage ²⁾ $I_C = 2\text{ A}$, $I_B = 0.2\text{ A}$	V_{CEsat}	-	-	0.5	V
Base emitter saturation voltage ²⁾ $I_C = 2\text{ A}$, $I_B = 0.2\text{ A}$	V_{BEsat}	-	-	1.3	

AC Characteristics

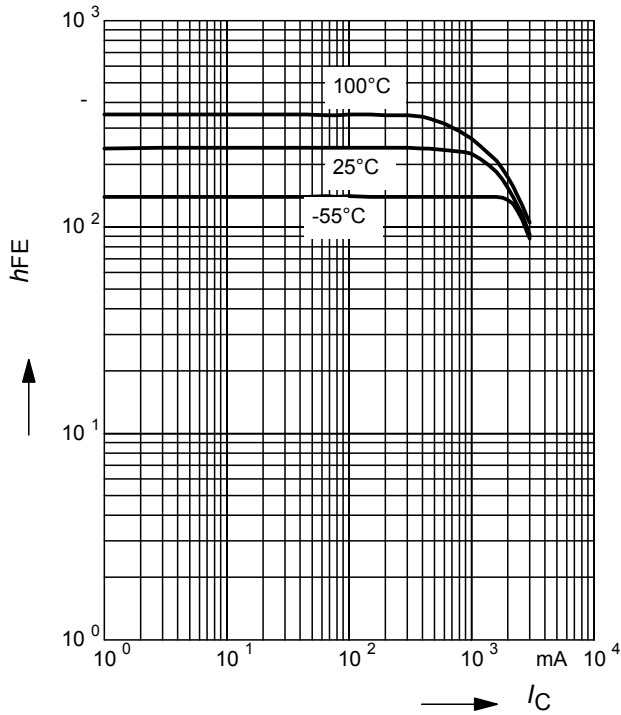
Transition frequency $I_C = 50\text{ mA}$, $V_{CE} = 10\text{ V}$, $f = 100\text{ MHz}$	f_T	-	100	-	MHz
Collector-base capacitance $V_{CB} = 10\text{ V}$, $f = 1\text{ MHz}$	C_{cb}	-	25	-	pF

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

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

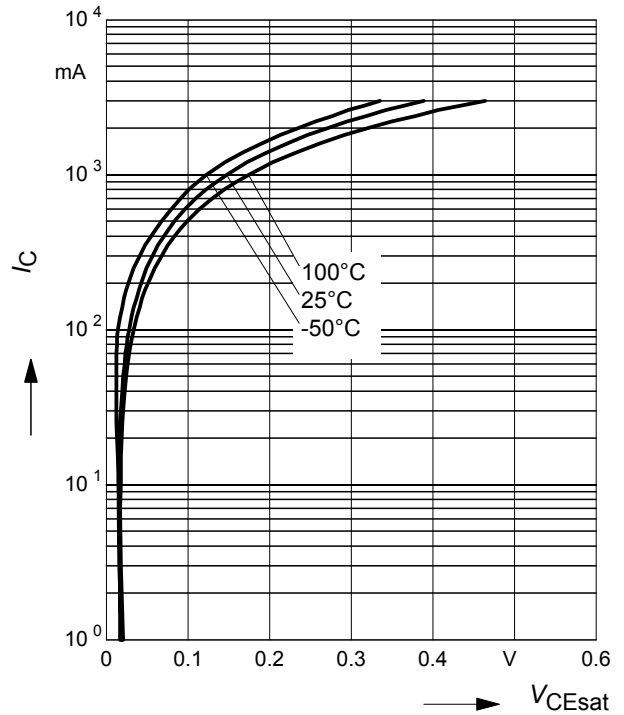
DC current gain $h_{FE} = f(I_C)$

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



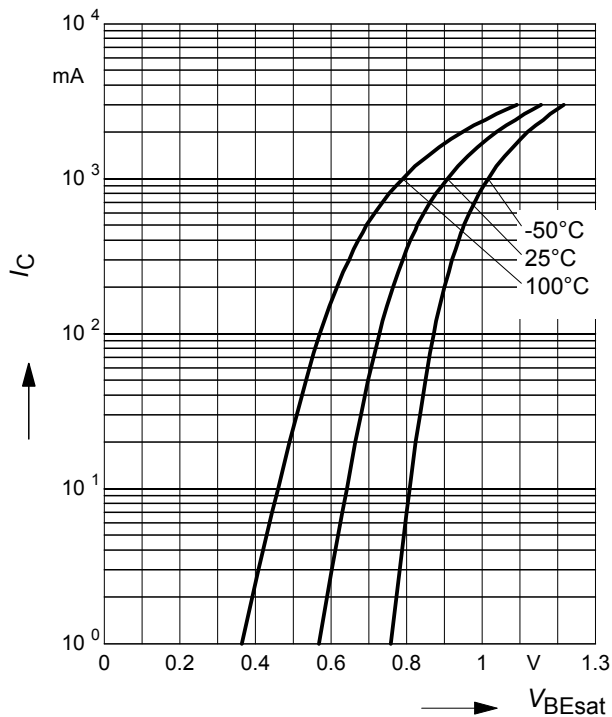
Collector-emitter saturation voltage

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



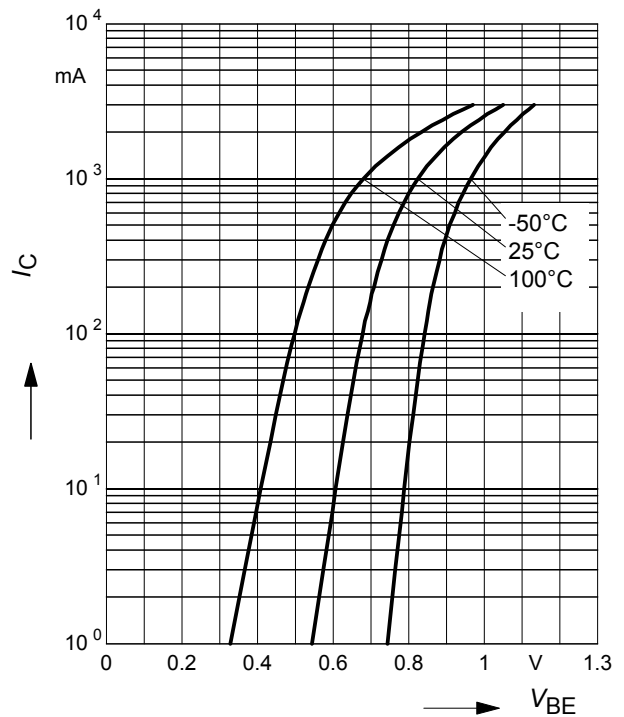
Base-emitter saturation voltage

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



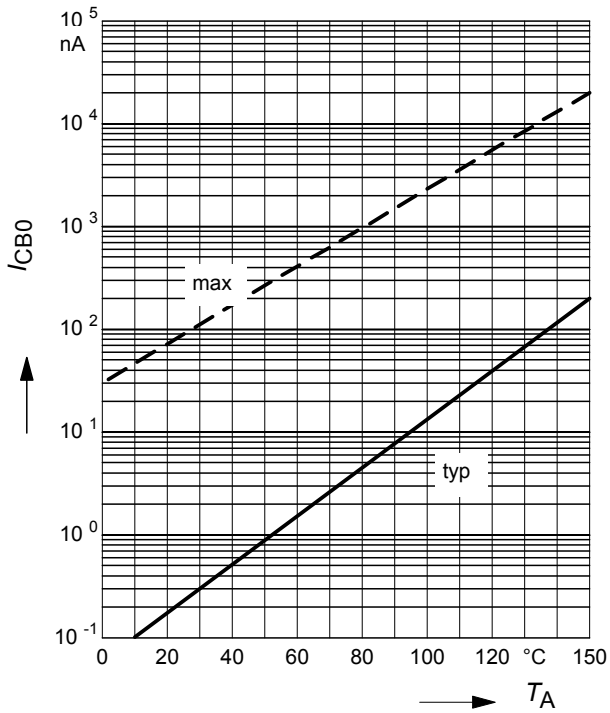
Collector current $I_C = f(V_{BE})$

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



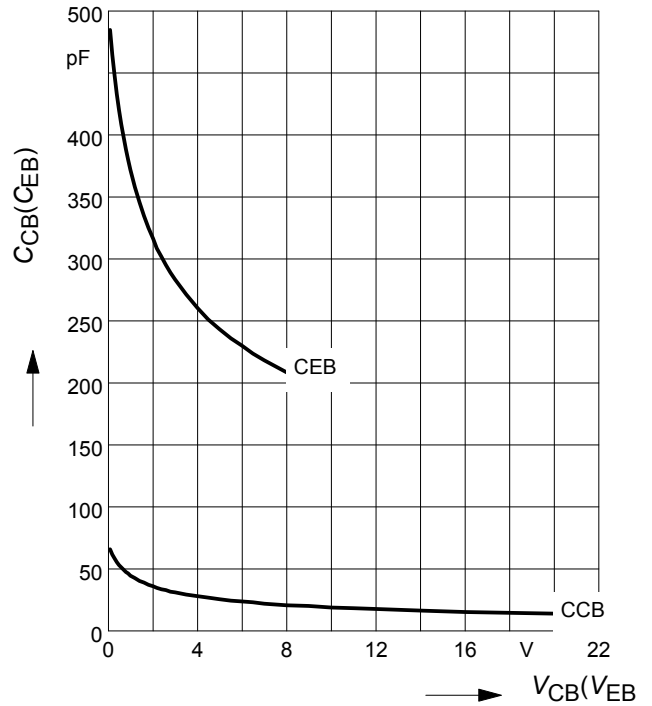
Collector cutoff current $I_{CBO} = f(T_A)$

$V_{CB} = 45\text{ V}$

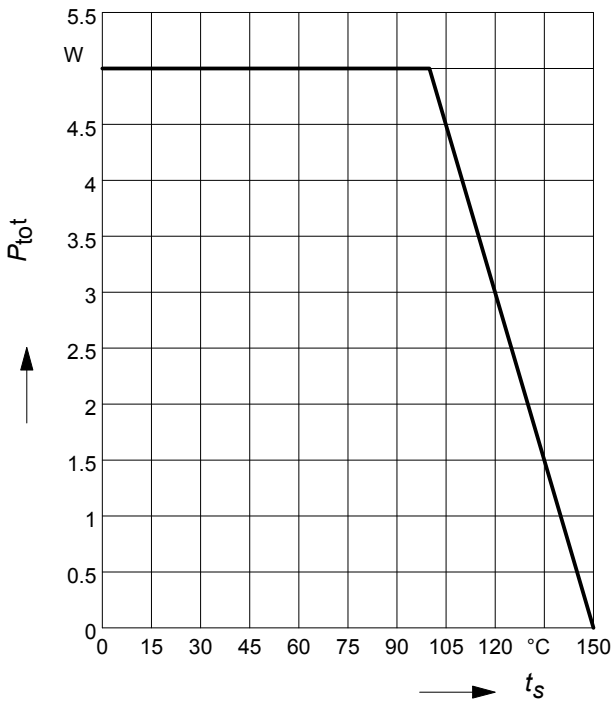


Collector-base capacitance $C_{cb} = f(V_{CB})$

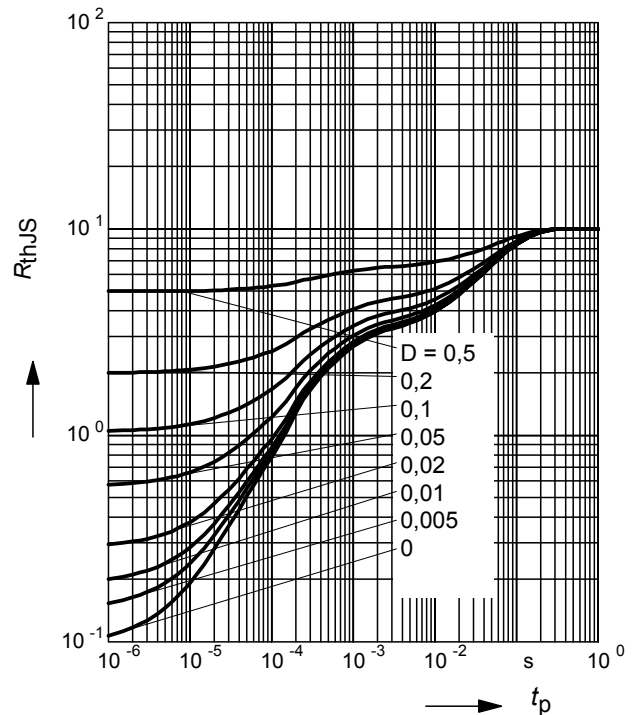
Emitter-base capacitance $C_{eb} = f(V_{EB})$



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



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

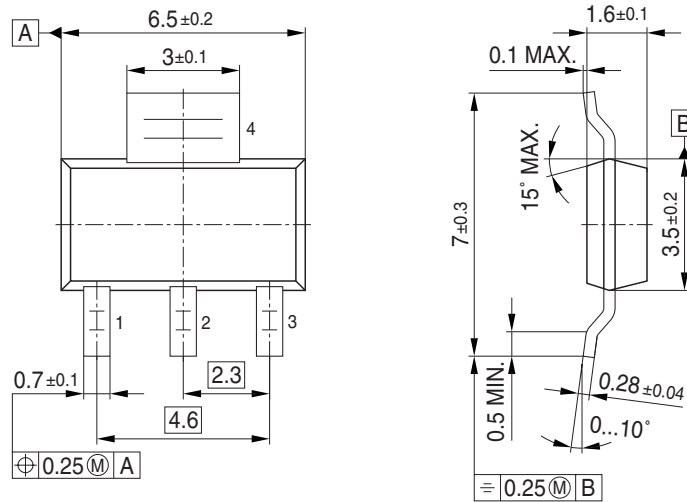


Permissible Pulse Load

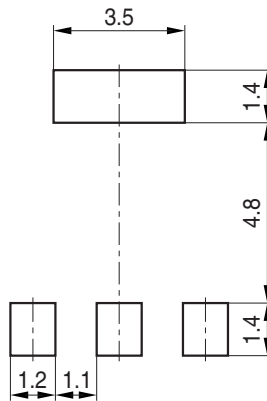
$$P_{\text{totmax}}/P_{\text{totDC}} = f(t_p)$$



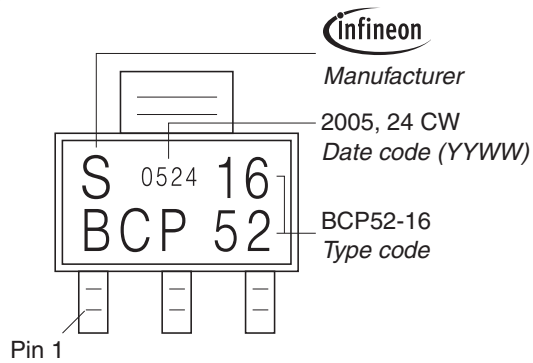
Package Outline



Foot Print

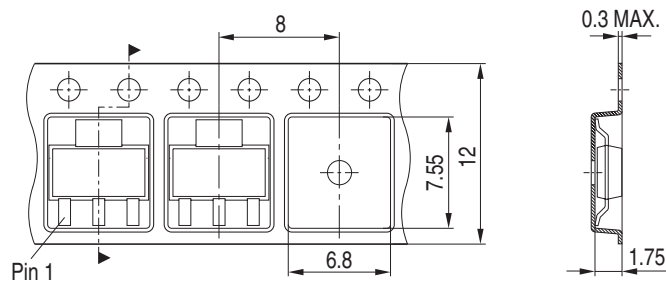


Marking Layout (Example)



Packing

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



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