

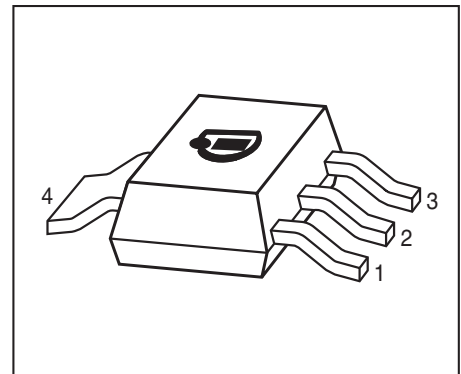


**THE DATASHEET OF  
PIC18F4580-I/PT**



**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 <sup>1)</sup>	$R_{thJS}$	$\leq 10$	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 $I_C = 10\text{ mA}$ , $I_B = 0$ , 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 $I_C = 100\ \mu\text{A}$ , $I_E = 0$ , BDP947 $I_C = 100\ \mu\text{A}$ , $I_E = 0$ , BDP949 $I_C = 0$ , $I_E = 100\ \mu\text{A}$ , BDP953	$V_{(BR)CBO}$	45 60 120	- - -	- - -	
Emitter-base breakdown voltage $I_E = 10\ \mu\text{A}$ , $I_C = 0$	$V_{(BR)EBO}$	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	$\mu\text{A}$
Emitter-base cutoff current $V_{EB} = 4\text{ V}$ , $I_C = 0$	$I_{EBO}$	-	-	100	nA
DC current gain <sup>2)</sup> $I_C = 10\text{ mA}$ , $V_{CE} = 5\text{ V}$ $I_C = 500\text{ mA}$ , $V_{CE} = 1\text{ V}$ $I_C = 2\text{ A}$ , $V_{CE} = 2\text{ V}$ , BDP947, BDP949 $I_C = 2\text{ A}$ , $V_{CE} = 2\text{ V}$ , BDP953	$h_{FE}$	25 100 50 15	- - - -	- 475 - -	-
Collector-emitter saturation voltage <sup>2)</sup> $I_C = 2\text{ A}$ , $I_B = 0.2\text{ A}$	$V_{CEsat}$	-	-	0.5	V
Base emitter saturation voltage <sup>2)</sup> $I_C = 2\text{ A}$ , $I_B = 0.2\text{ A}$	$V_{BEsat}$	-	-	1.3	

**AC Characteristics**

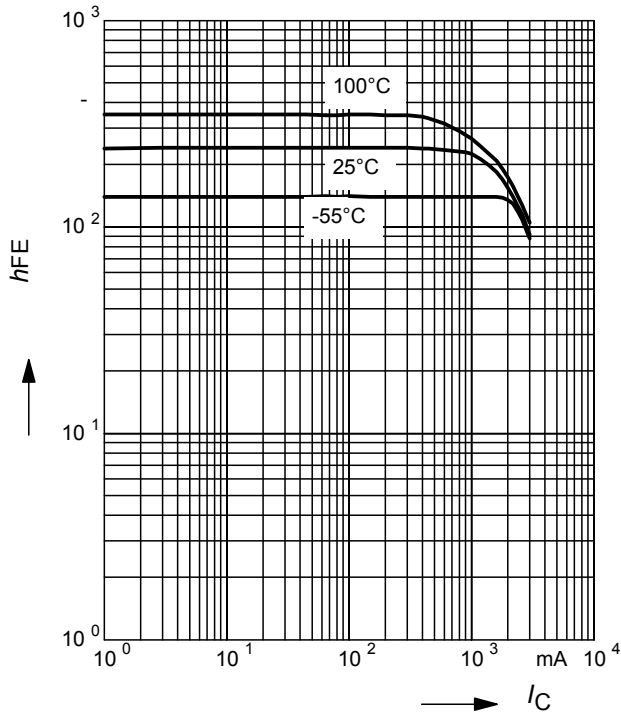
Transition frequency $I_C = 50\text{ mA}$ , $V_{CE} = 10\text{ V}$ , $f = 100\text{ MHz}$	$f_T$	-	100	-	MHz
Collector-base capacitance $V_{CB} = 10\text{ V}$ , $f = 1\text{ MHz}$	$C_{cb}$	-	25	-	pF

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

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

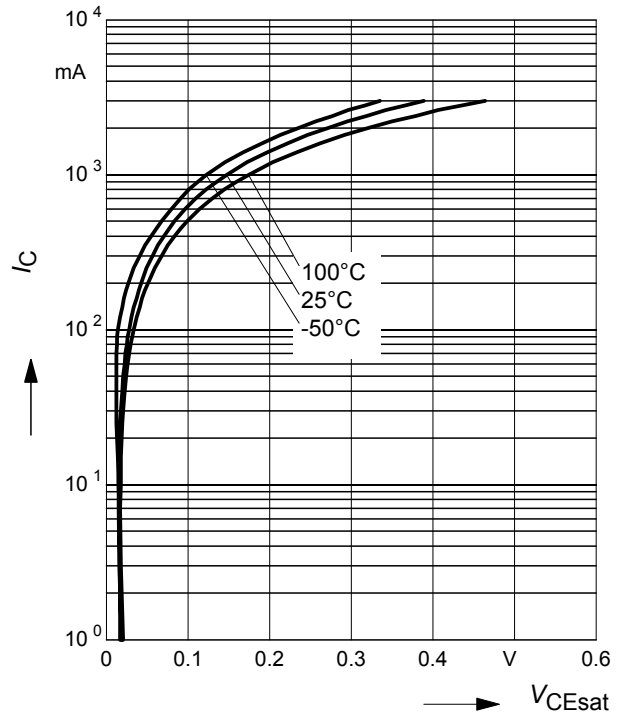
**DC current gain  $h_{FE} = f(I_C)$**

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



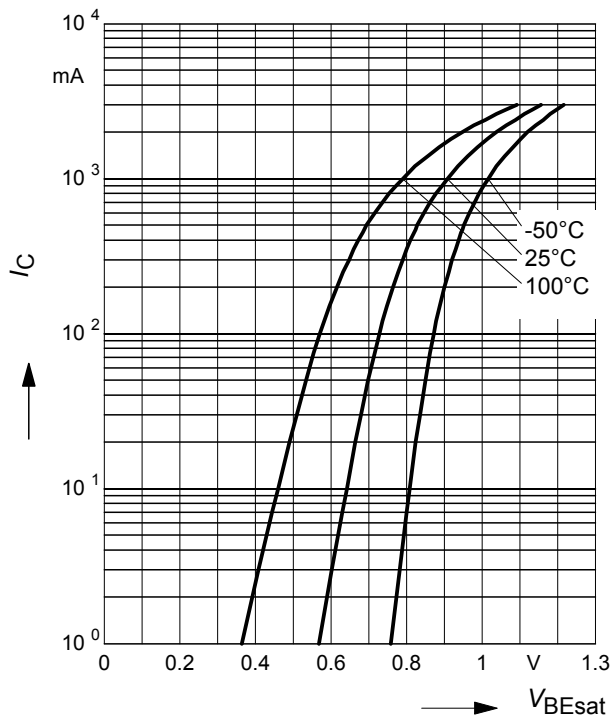
**Collector-emitter saturation voltage**

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



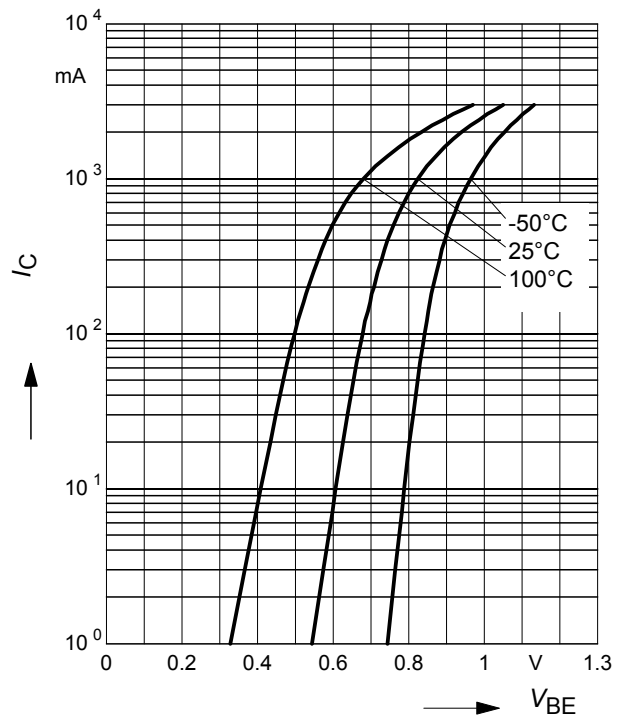
**Base-emitter saturation voltage**

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



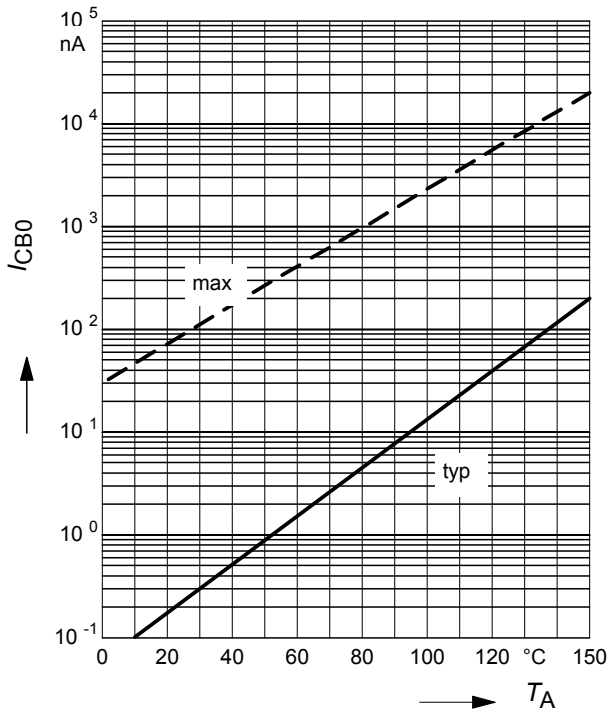
**Collector current  $I_C = f(V_{BE})$**

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



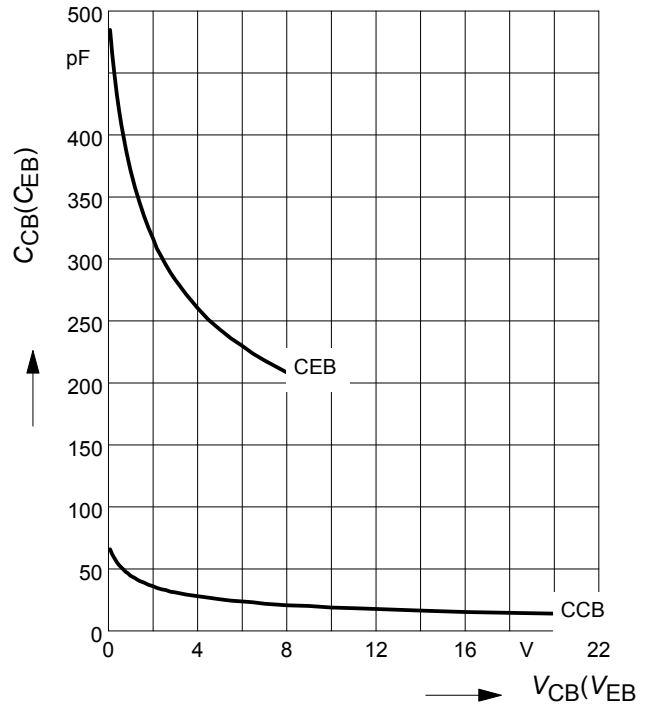
Collector cutoff current  $I_{CBO} = f(T_A)$

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

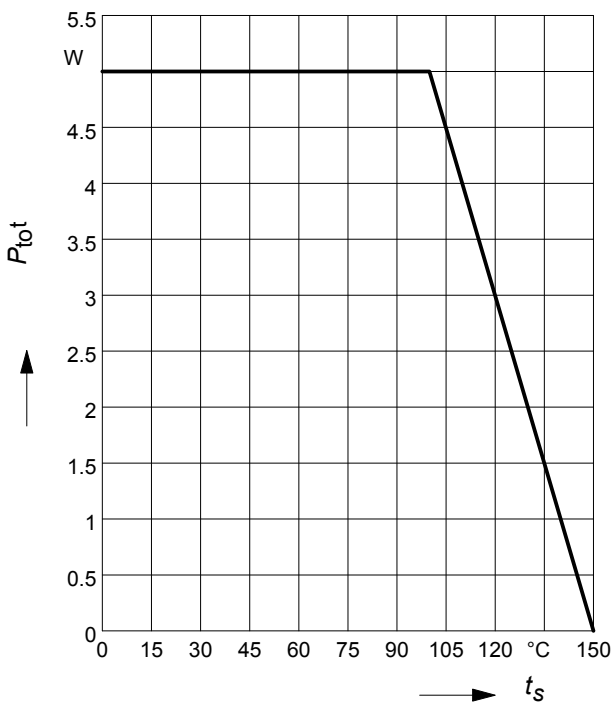


Collector-base capacitance  $C_{cb} = f(V_{CB})$

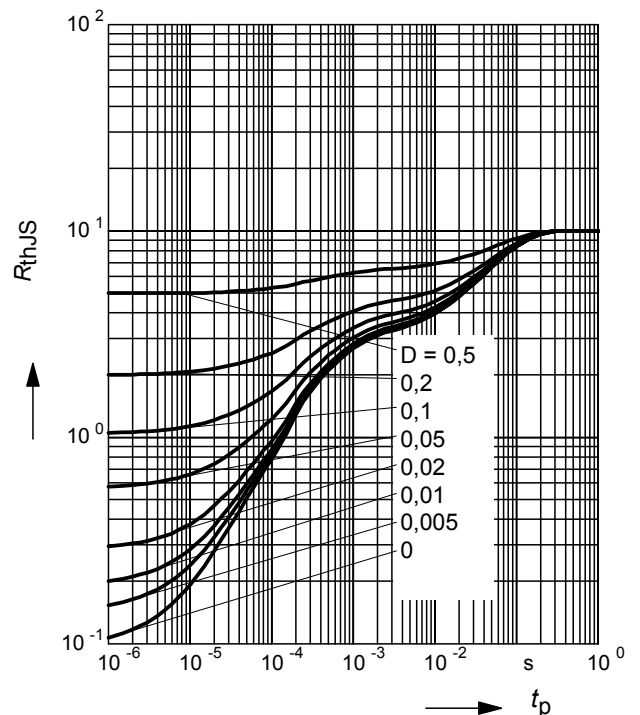
Emitter-base capacitance  $C_{eb} = f(V_{EB})$



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

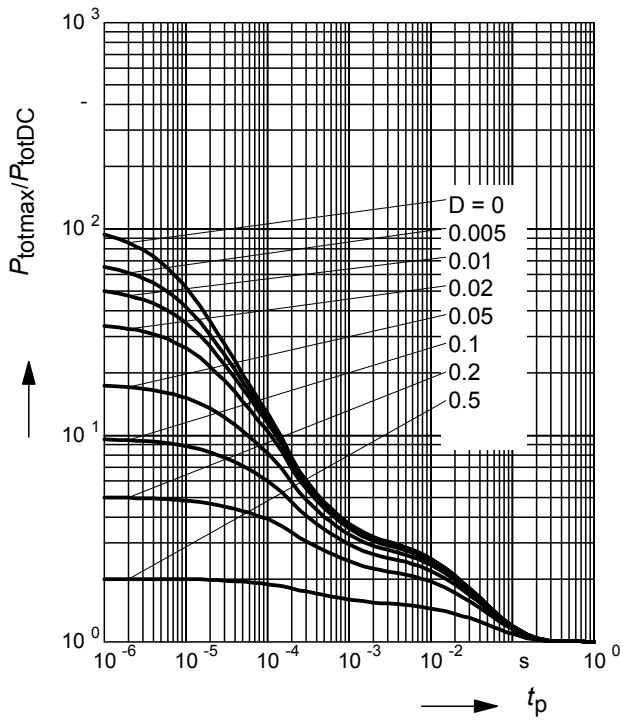


Permissible Pulse Load  $R_{thJS} = f(t_p)$

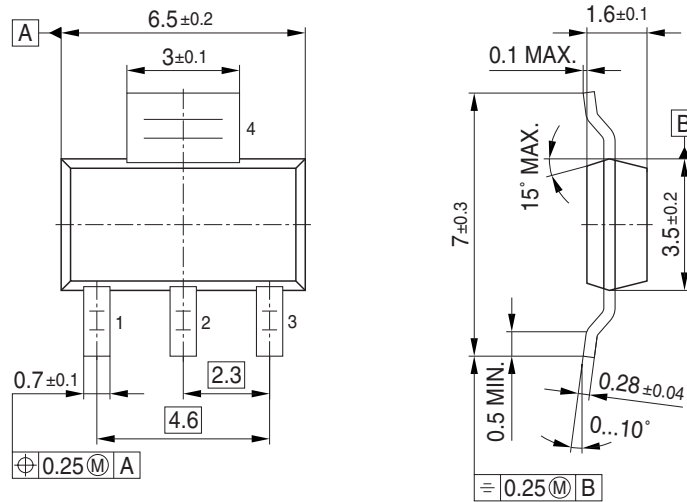
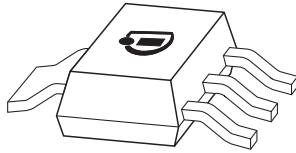


**Permissible Pulse Load**

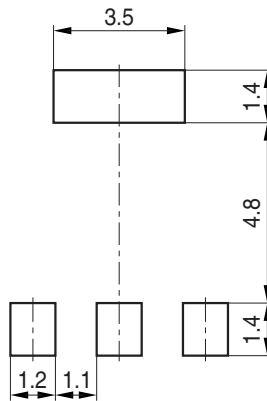
$$P_{\text{totmax}}/P_{\text{totDC}} = f(t_p)$$



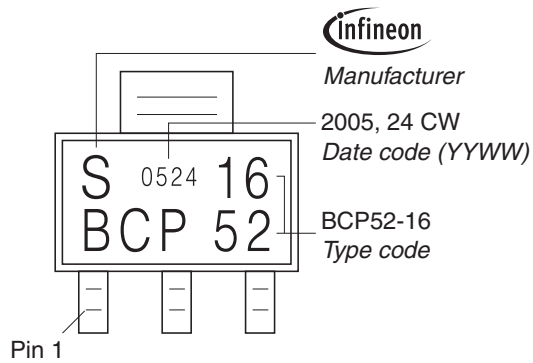
Package Outline



Foot Print

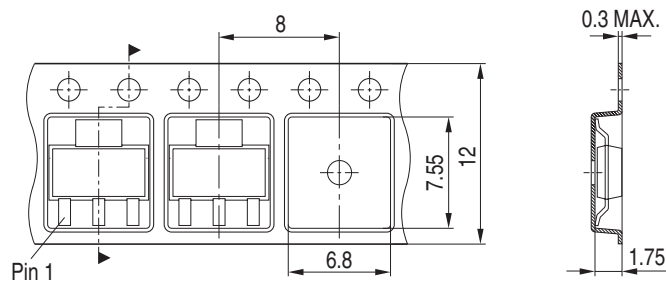


Marking Layout (Example)



Packing

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



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