

**NPN/PNP Silicon AF Transistor Arrays**

- For AF input stage and driver applications
- High current gain
- Low collector-emitter saturation voltage
- Two (galvanic) internal isolated NPN/PNP transistor in one package
- Pb-free (RoHS compliant) package
- Qualified according AEC Q101



**BC846PN**  
**BC846UPN**  
**BC847PN**



Type	Marking	Pin Configuration						Package
BC846PN	1Os	1=E1	2=B1	3=C2	4=E2	5=B2	6=C1	SOT363
BC846UPN	1Os	1=E1	2=B1	3=C2	4=E2	5=B2	6=C1	SC74
BC847PN	1Ps	1=E1	2=B1	3=C2	4=E2	5=B2	6=C1	SOT363

**Maximum Ratings**

Parameter	Symbol	Value	Unit
Collector-emitter voltage BC846PN/UPN BC847PN	$V_{CEO}$	65 45	V
Collector-emitter voltage BC846PN/UPN BC847PN	$V_{CES}$	80 50	
Collector-base voltage BC846PN/UPN BC847PN	$V_{CBO}$	80 50	
Emitter-base voltage	$V_{EBO}$	6	
Collector current	$I_C$	100	mA
Peak collector current, $t_p \leq 10$ ms	$I_{CM}$	200	
Total power dissipation- $T_S \leq 115^\circ\text{C}$ , BC846PN, BC847PN $T_S \leq 118^\circ\text{C}$ , BC846UPN	$P_{tot}$	250 250	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> BC846PN, BC847PN BC846UPN	$R_{thJS}$	$\leq 140$ $\leq 130$	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 $I_C = 10\text{ mA}$ , $I_B = 0$ , BC846PN/UPN $I_C = 10\text{ mA}$ , $I_B = 0$ , BC847PN	$V_{(BR)CEO}$	65 45	- -	- -	V
Collector-base breakdown voltage $I_C = 10\text{ }\mu\text{A}$ , $I_E = 0$ , BC846PN/UPN $I_C = 10\text{ }\mu\text{A}$ , $I_E = 0$ , BC847PN	$V_{(BR)CBO}$	80 50	- -	- -	
Collector-emitter breakdown voltage $I_C = 10\text{ }\mu\text{A}$ , $V_{BE} = 0$ , BC846PN/UPN $I_C = 10\text{ }\mu\text{A}$ , $V_{BE} = 0$ , BC847PN	$V_{(BR)CES}$	80 50	- -	- -	
Emitter-base breakdown voltage $I_E = 1\text{ }\mu\text{A}$ , $I_C = 0$	$V_{(BR)EBO}$	6	-	-	
Collector-base cutoff current $V_{CB} = 50\text{ V}$ , $I_E = 0$ $V_{CB} = 30\text{ V}$ , $I_E = 0$ , $T_A = 150^\circ\text{C}$	$I_{CBO}$	- -	- -	0.015 5	$\mu\text{A}$
DC current gain- $I_C = 10\text{ }\mu\text{A}$ , $V_{CE} = 5\text{ V}$ $I_C = 2\text{ mA}$ , $V_{CE} = 5\text{ V}$	$h_{FE}$	- 200	250 290	- 450	-
Collector-emitter saturation voltage <sup>1)</sup> $I_C = 10\text{ mA}$ , $I_B = 0.5\text{ mA}$ $I_C = 100\text{ mA}$ , $I_B = 5\text{ mA}$	$V_{CEsat}$	- -	90 200	300 650	mV
Base emitter saturation voltage <sup>-1)</sup> $I_C = 10\text{ mA}$ , $I_B = 0.5\text{ mA}$ $I_C = 100\text{ mA}$ , $I_B = 5\text{ mA}$	$V_{BEsat}$	- -	700 900	- -	
Base-emitter voltage <sup>-1)</sup> $I_C = 2\text{ mA}$ , $V_{CE} = 5\text{ V}$ $I_C = 10\text{ mA}$ , $V_{CE} = 5\text{ V}$	$V_{BE(ON)}$	580 -	660 -	750 820	

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

**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 $I_C = 10\text{ mA}, V_{CE} = 5\text{ V}, f = 100\text{ MHz}$	$f_T$	-	250	-	MHz
Collector-base capacitance $V_{CB} = 10\text{ V}, f = 1\text{ MHz}$	$C_{cb}$	-	1.5	-	pF
Emitter-base capacitance $V_{EB} = 0.5\text{ V}, f = 1\text{ MHz}$	$C_{eb}$	-	8	-	
Short-circuit input impedance $I_C = 2\text{ mA}, V_{CE} = 5\text{ V}, f = 1\text{ kHz}$	$h_{11e}$	-	4.5	-	k $\Omega$
Open-circuit reverse voltage transf. ratio $I_C = 2\text{ mA}, V_{CE} = 5\text{ V}, f = 1\text{ kHz}$	$h_{12e}$	-	2	-	$10^{-4}$
Short-circuit forward current transf. ratio $I_C = 2\text{ mA}, V_{CE} = 5\text{ V}, f = 1\text{ kHz}$	$h_{21e}$	-	330	-	-
Open-circuit output admittance $I_C = 2\text{ mA}, V_{CE} = 5\text{ V}, f = 1\text{ kHz}$	$h_{22e}$	-	30	-	$\mu\text{S}$

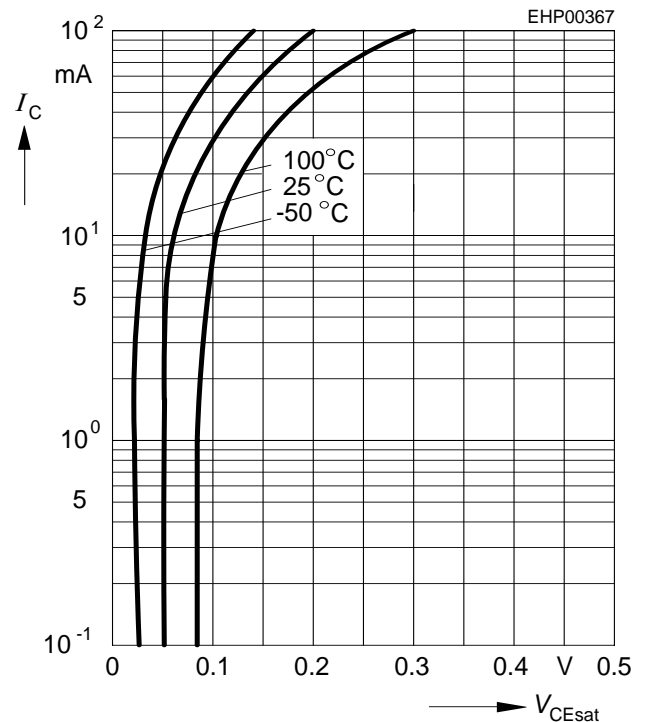
**DC current gain  $h_{FE} = f(I_C)$**

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



**Collector-emitter saturation voltage**

$I_C = f(V_{CEsat}), h_{FE} = 20$



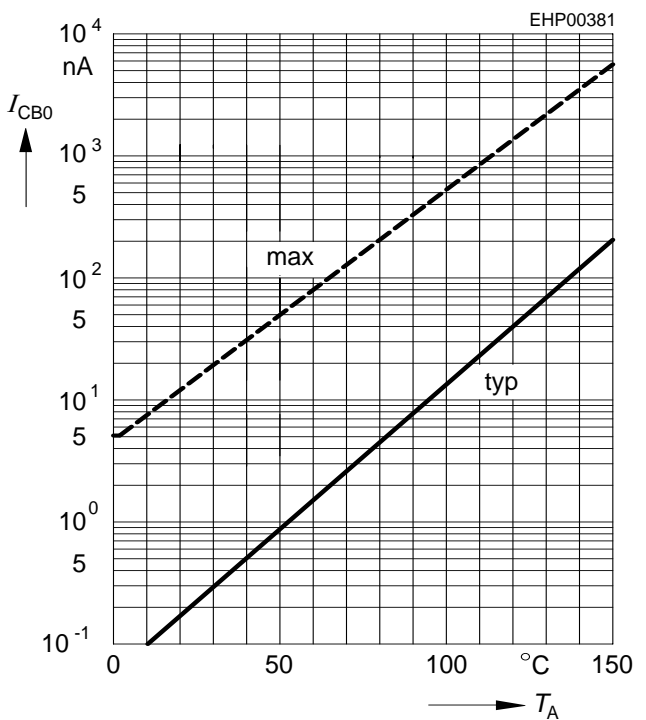
**Base-emitter saturation voltage**

$I_C = f(V_{BEsat}), h_{FE} = 20$



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

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



Transition frequency  $f_T = f(I_C)$

$V_{CE} = 5\text{ V}, f = 100\text{ MHz}$



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

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



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

BC846PN, BC847PN



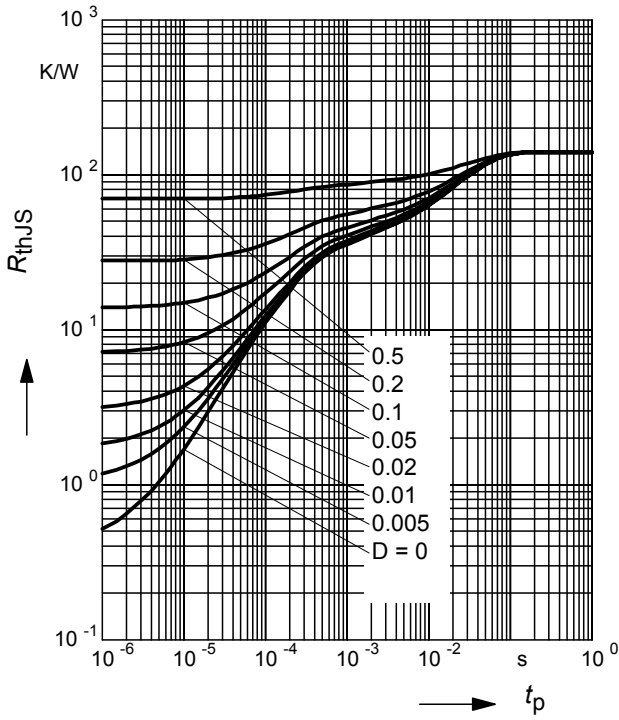
Total power dissipation  $P_{tot} = f(T_S)$

BC846UPN



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

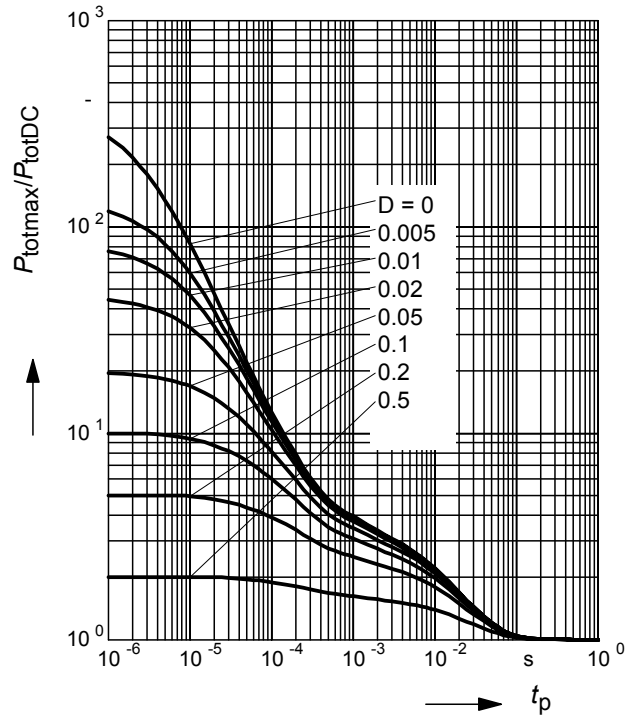
BC846PN, BC847PN



**Permissible Pulse Load**

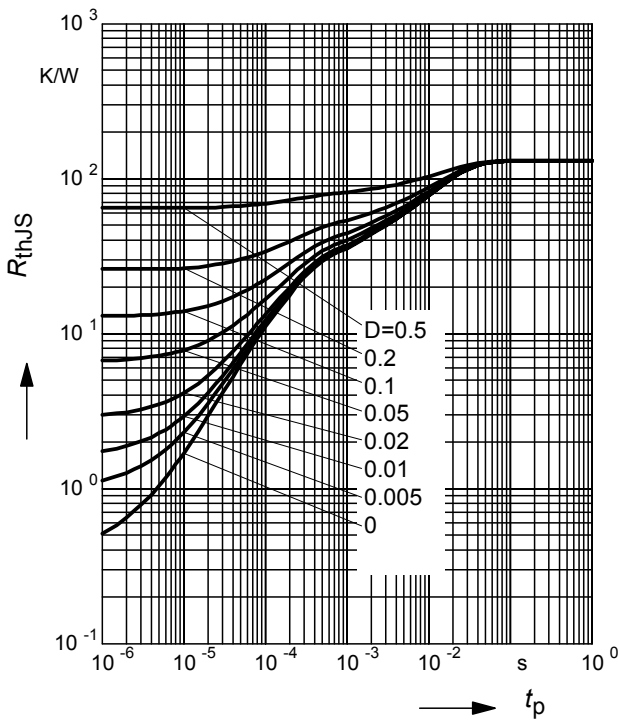
$P_{totmax}/P_{totDC} = f(t_p)$

BC846PN, BC847PN



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

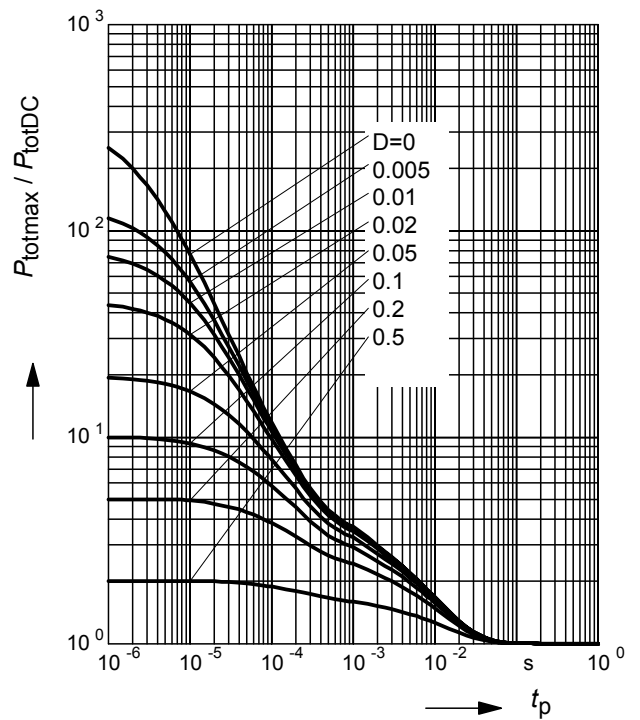
BC846UPN



**Permissible Pulse Load**

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

BC846UPN



Package Outline



Foot Print



Marking Layout (Example)

Small variations in positioning of Date code, Type code and Manufacture are possible.



Standard Packing

Reel ø180 mm = 3.000 Pieces/Reel  
 Reel ø330 mm = 10.000 Pieces/Reel

For symmetric types no defined Pin 1 orientation in reel.





### Package Outline



### Foot Print



### Marking Layout (Example)

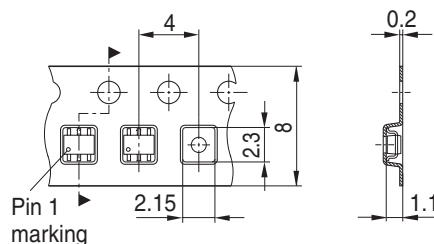
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