

**PNP Silicon AF Transistor Arrays**

- For AF input stages and driver applications
- High current gain
- Low collector-emitter saturation voltage
- Two (galvanic) internal isolated transistor with good matching in one package
- BC856S / U, BC857S: For orientation in reel see package information below
- Pb-free (RoHS compliant) package
- Qualified according AEC Q101


**BC856S/U  
BC857S**


Type	Marking	Pin Configuration						Package
		1=E1	2=B1	3=C2	4=E2	5=B2	6=C1	
BC856S	3Ds	1=E1	2=B1	3=C2	4=E2	5=B2	6=C1	SOT363
BC856U	3Ds	1=E1	2=B1	3=C2	4=E2	5=B2	6=C1	SC74
BC857S	3Cs	1=E1	2=B1	3=C2	4=E2	5=B2	6=C1	SOT363

**Maximum Ratings**

Parameter	Symbol	Value	Unit
Collector-emitter voltage BC856S/U BC857S	$V_{CEO}$	65 45	-
Collector-base voltage BC856S, BC856U BC857S	$V_{CBO}$	80 50	V
Emitter-base voltage	$V_{EBO}$	5	
Collector current	$I_C$	100	mA
Peak collector current, $t_p \leq 10$ ms	$I_{CM}$	200	
Total power dissipation- $T_S \leq 115$ °C, BC856S $T_S \leq 118$ °C, BC856U, BC857U	$P_{tot}$	250 250	-
Junction temperature	$T_j$	150	°C
Storage temperature	$T_{stg}$	-65 ... 150	

**Thermal Resistance**

Parameter	Symbol	Value	Unit
Junction - soldering point <sup>1)</sup> BC856S, BC857S BC856U	$R_{thJS}$	$\leq 140$ $\leq 130$	K/W

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

**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 $I_C = 10\text{ mA}$ , $I_B = 0$ , BC856S/U $I_C = 10\text{ mA}$ , $I_B = 0$ , BC857S	$V_{(BR)CEO}$	65 45	- -	- -	-
Collector-base breakdown voltage $I_C = 10\text{ }\mu\text{A}$ , $I_E = 0$ , BC856S/U $I_C = 10\text{ }\mu\text{A}$ , $I_E = 0$ , BC857S	$V_{(BR)CBO}$	80 50	- -	- -	-
Emitter-base breakdown voltage $I_E = 10\text{ }\mu\text{A}$ , $I_C = 0$	$V_{(BR)EBO}$	5	-	-	V
Collector-base cutoff current $V_{CB} = 45\text{ V}$ , $I_E = 0$ $V_{CB} = 45\text{ V}$ , $I_E = 0$ , $T_A = 150\text{ }^\circ\text{C}$	$I_{CBO}$	- -	- -	0.015 5	$\mu\text{A}$
DC current gain <sup>1)</sup> $I_C = 10\text{ }\mu\text{A}$ , $V_{CE} = 5\text{ V}$ $I_C = 2\text{ mA}$ , $V_{CE} = 5\text{ V}$	$h_{FE}$	- 200	250 290	- 630	-
Collector-emitter saturation voltage <sup>1)</sup> $I_C = 10\text{ mA}$ , $I_B = 0.5\text{ mA}$ $I_C = 100\text{ mA}$ , $I_B = 5\text{ mA}$	$V_{CEsat}$	- -	75 250	300 650	mV
Base emitter saturation voltage <sup>1)</sup> $I_C = 10\text{ mA}$ , $I_B = 0.5\text{ mA}$ $I_C = 100\text{ mA}$ , $I_B = 5\text{ mA}$	$V_{BEsat}$	- -	700 850	- -	-
Base-emitter voltage <sup>1)</sup> $I_C = 2\text{ mA}$ , $V_{CE} = 5\text{ V}$ $I_C = 10\text{ mA}$ , $V_{CE} = 5\text{ V}$	$V_{BE(ON)}$	600 -	650 -	750 820	mV

<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 $I_C = 20 \text{ mA}, V_{CE} = 5 \text{ V}, f = 100 \text{ MHz}$	$f_T$	-	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	-	$\mu\text{S}$
Noise figure $I_C = 200 \mu\text{A}, V_{CE} = 5 \text{ V}, f = 1 \text{ kHz},$ $\Delta f = 200 \text{ Hz}, R_S = 2 \text{ k}\Omega$	$F$	-	-	10	dB

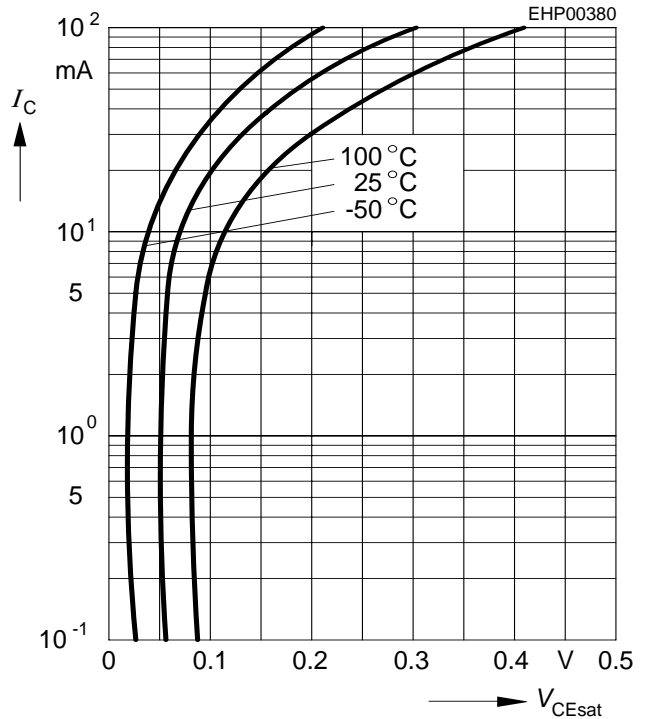
**DC current gain  $h_{FE} = f(I_C)$**

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



**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  $I_{CBO} = f(T_A)$**

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



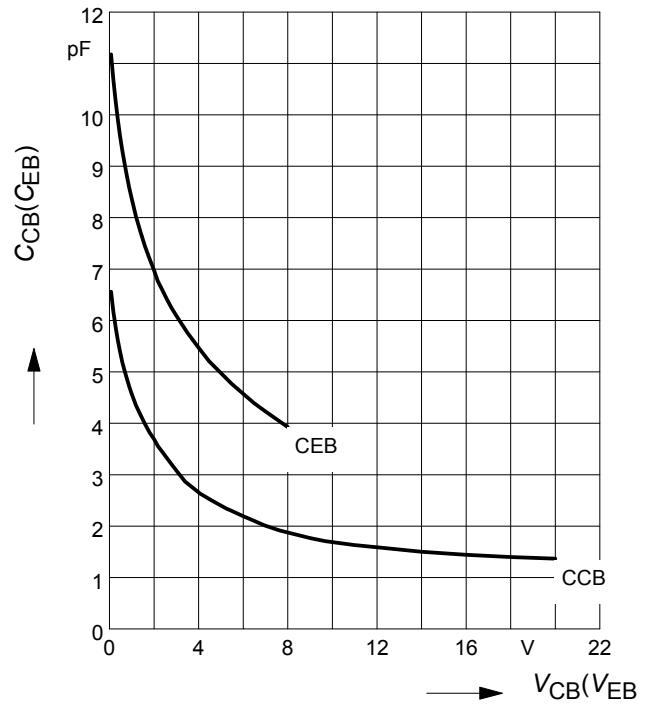
Transition frequency  $f_T = f(I_C)$

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



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

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



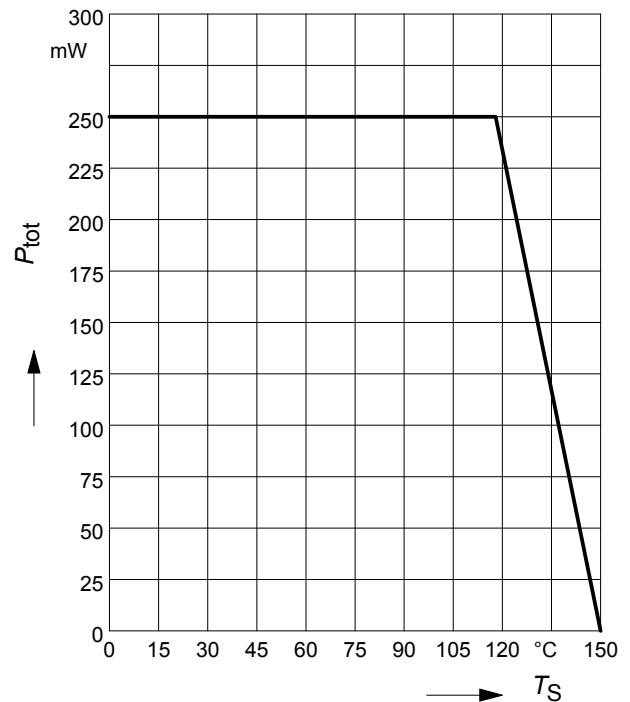
Total power dissipation  $P_{tot} = f(T_S)$

BC856S, BC857S



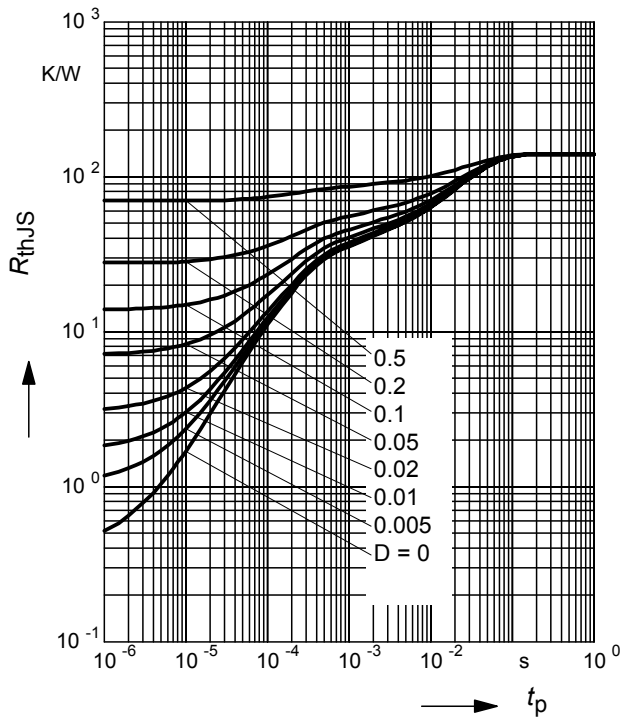
Total power dissipation  $P_{tot} = f(T_S)$

BC856U



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

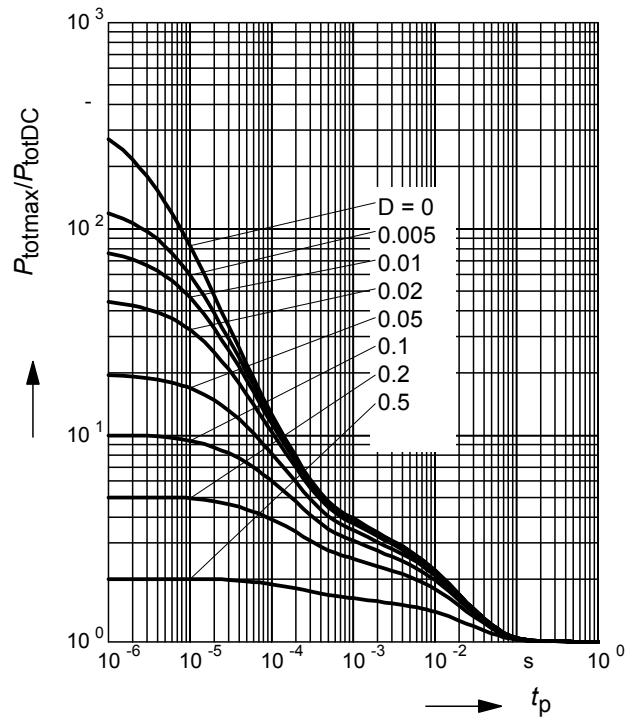
BC856S; BC857S



**Permissible Pulse Load**

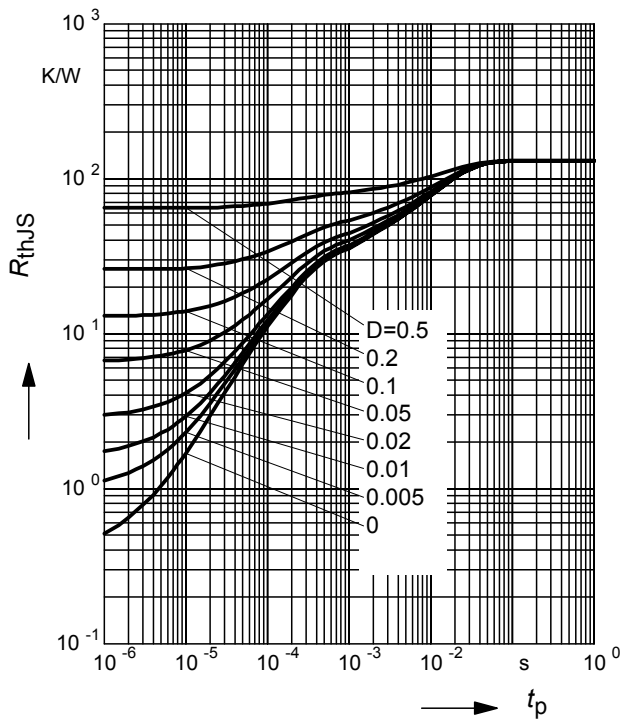
$P_{totmax}/P_{totDC} = f(t_p)$

BC856S, BC857S



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

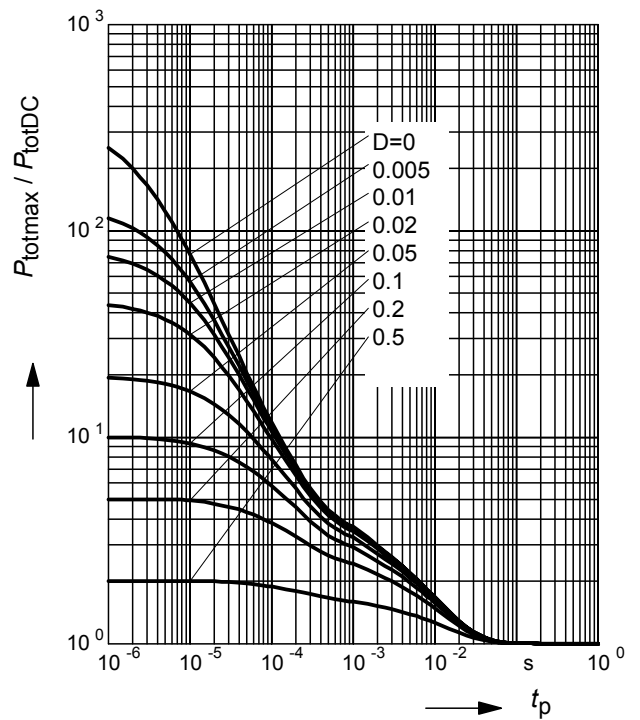
BC856U



**Permissible Pulse Load**

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

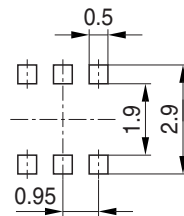
BC856U



Package Outline



Foot Print



Marking Layout (Example)

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



Standard Packing

Reel  $\varnothing$ 180 mm = 3.000 Pieces/Reel  
 Reel  $\varnothing$ 330 mm = 10.000 Pieces/Reel

For symmetric types no defined Pin 1 orientation in reel.





### Package Outline



### Foot Print



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