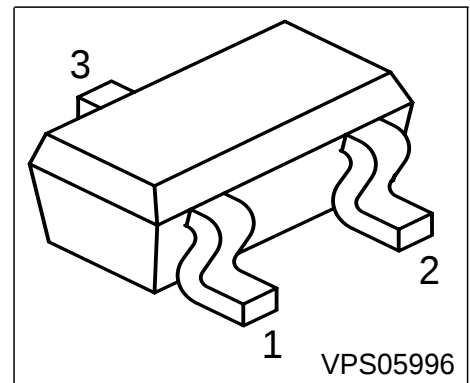


PNP Silicon AF Transistor

- For AF input stages and driver applications
- High current gain
- Low collector-emitter saturation voltage
- Complementary types: BC847...T



Type	Marking	Pin Configuration			Package
BC857AT	3Es	1 = B	2 = E	3 = C	SC75
BC857BT	3Fs	1 = B	2 = E	3 = C	SC75

Maximum Ratings

Parameter	Symbol	Value	Unit
Collector-emitter voltage	V_{CEO}	45	V
Collector-base voltage	V_{CBO}	50	
Collector-emitter voltage	V_{CES}	50	
Emitter-base voltage	V_{EBO}	5	
DC collector current	I_C	100	mA
Peak collector current	I_{CM}	200	
Total power dissipation, $T_S = 109\text{ °C}$	P_{tot}	250	mW
Junction temperature	T_j	150	°C
Storage temperature	T_{stg}	-65 ... 150	

Thermal Resistance

Junction - soldering point ¹⁾	R_{thJS}	≤165	K/W
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¹⁾For calculation of R_{thJA} please refer to Application Note Thermal Resistance

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

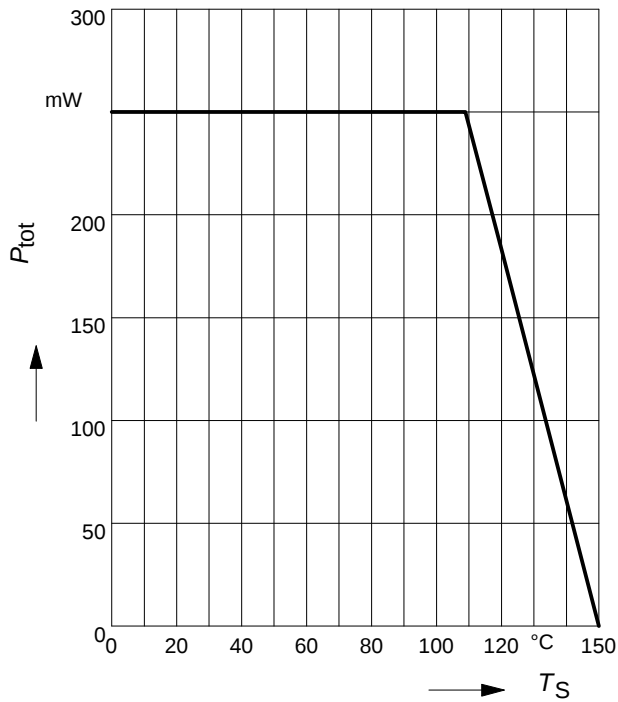
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
DC characteristics					
Collector-emitter breakdown voltage $I_C = 10\text{ mA}$, $I_B = 0$	$V_{(BR)CEO}$	45	-	-	V
Collector-base breakdown voltage $I_C = 10\text{ }\mu\text{A}$, $I_B = 0$	$V_{(BR)CBO}$	50	-	-	
Collector-emitter breakdown voltage $I_C = 10\text{ }\mu\text{A}$, $V_{BE} = 0$	$V_{(BR)CES}$	50	-	-	
Emitter-base breakdown voltage $I_E = 1\text{ }\mu\text{A}$, $I_C = 0$	$V_{(BR)EBO}$	5	-	-	
Collector cutoff current $V_{CB} = 30\text{ V}$, $I_E = 0$	I_{CBO}	-	-	15	nA
Collector cutoff current $V_{CB} = 30\text{ V}$, $I_E = 0$, $T_A = 150\text{ }^{\circ}\text{C}$	I_{CBO}	-	-	5	μA
DC current gain $I_C = 10\text{ }\mu\text{A}$, $V_{CE} = 5\text{ V}$ BC857AT BC857BT	h_{FE}	- -	140 250	- -	-
DC current gain $I_C = 2\text{ mA}$, $V_{CE} = 5\text{ V}$ BC857AT BC857BT	h_{FE}	125 220	180 290	250 475	
Collector-emitter saturation voltage1) $I_C = 10\text{ mA}$, $I_B = 0.5\text{ mA}$ $I_C = 100\text{ mA}$, $I_B = 5\text{ mA}$	V_{CEsat}	- -	75 250	300 650	
Base-emitter saturation voltage 1) $I_C = 10\text{ mA}$, $I_B = 0.5\text{ mA}$ $I_C = 100\text{ mA}$, $I_B = 5\text{ mA}$	V_{BEsat}	- -	700 850	- -	
Base-emitter voltage $I_C = 2\text{ mA}$, $V_{CE} = 5\text{ V}$ $I_C = 10\text{ mA}$, $V_{CE} = 5\text{ V}$	$V_{BE(ON)}$	600 -	650 -	750 820	

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

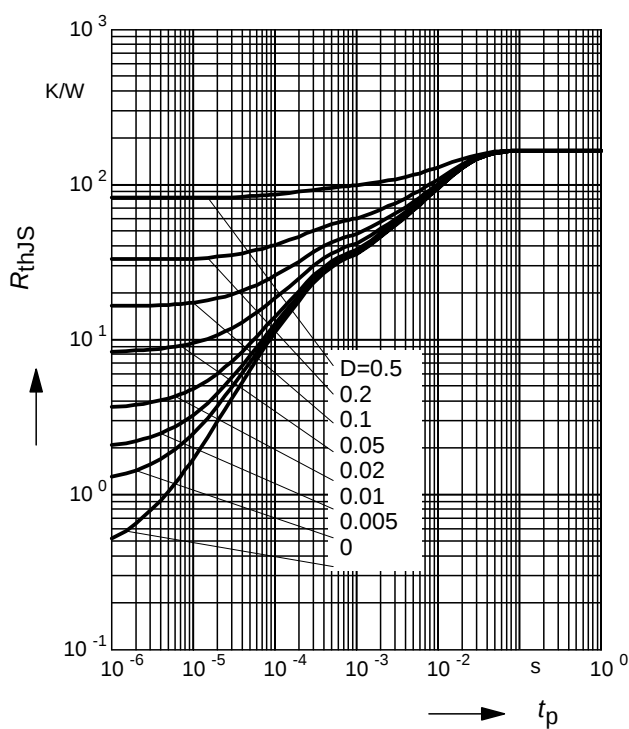
Electrical Characteristics at $T_A = 25\text{ °C}$, unless otherwise specified.

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
AC characteristics					
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}	-	2.5	-	pF
Emitter-base capacitance $V_{EB} = 0.5\text{ V}$, $f = 1\text{ MHz}$	C_{eb}	-	11	-	
Short-circuit input impedance $I_C = 2\text{ mA}$, $V_{CE} = 5\text{ V}$, $f = 1\text{ kHz}$	h_{11e}				kΩ
BC857AT		-	2.7	-	
BC857BT		-	4.5	-	
Open-circuit reverse voltage transf.ratio $I_C = 2\text{ mA}$, $V_{CE} = 5\text{ V}$, $f = 1\text{ kHz}$	h_{12e}				10^{-4}
BC857AT		-	1.5	-	
BC857BT		-	2	-	
Short-circuit forward current transf.ratio $I_C = 2\text{ mA}$, $V_{CE} = 5\text{ V}$, $f = 1\text{ kHz}$	h_{21e}				-
BC857AT		-	200	-	
BC857BT		-	330	-	
Open-circuit output admittance $I_C = 2\text{ mA}$, $V_{CE} = 5\text{ V}$, $f = 1\text{ kHz}$	h_{22e}				μS
BC857AT		-	18	-	
BC857BT		-	30	-	

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

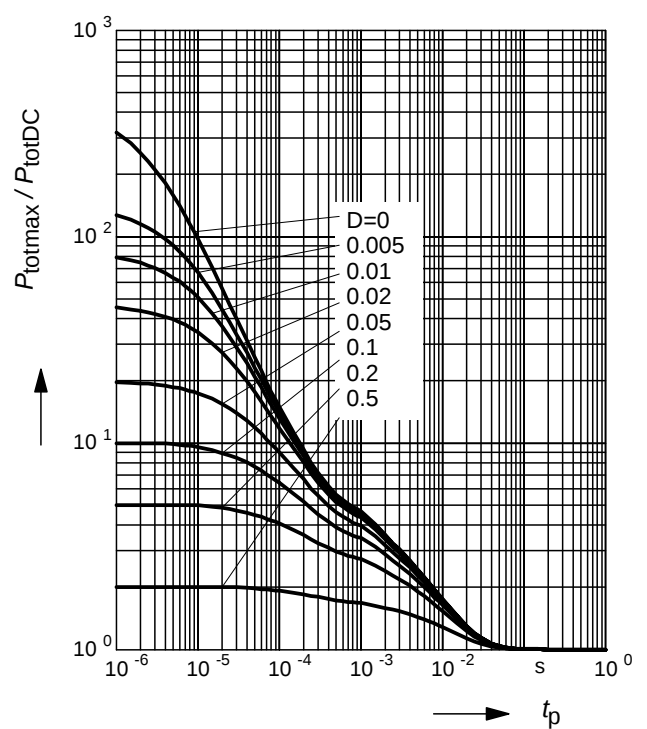


Permissible Pulse Load $R_{\text{thJS}} = f(t_p)$



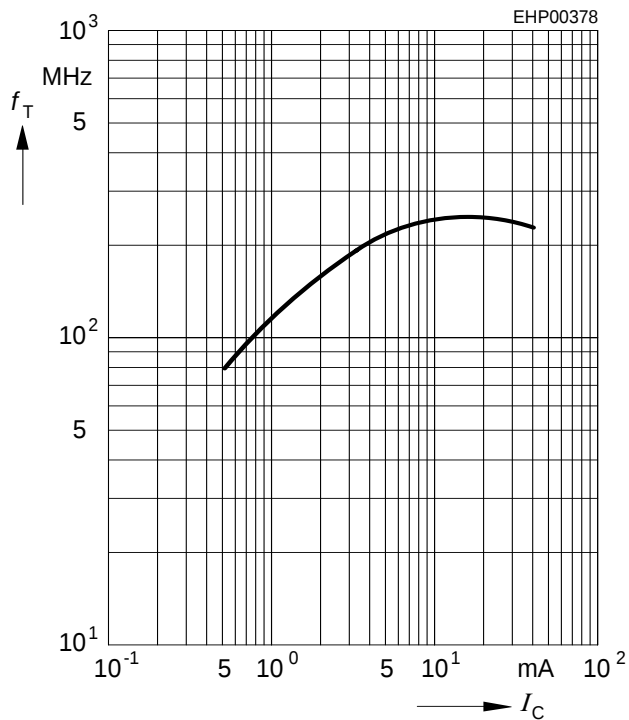
Permissible Pulse Load

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



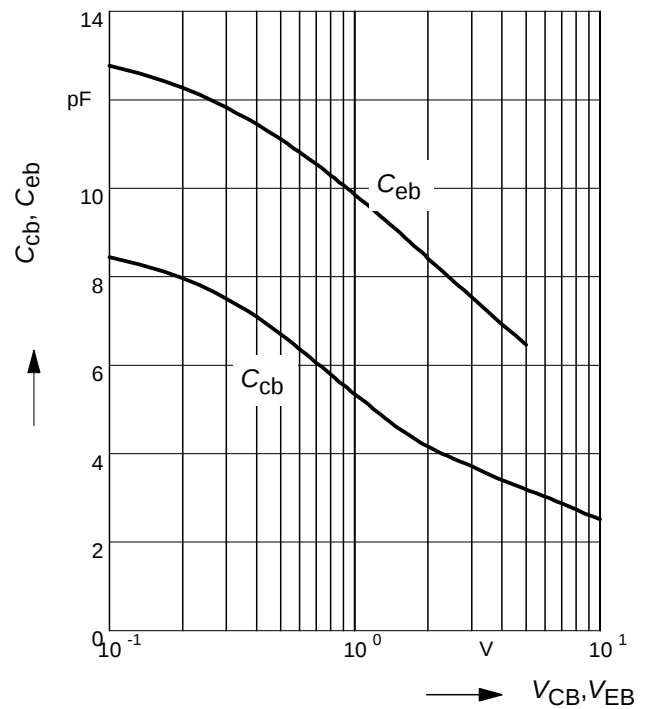
Transition frequency $f_T = f(I_C)$

$V_{CE} = 5V$



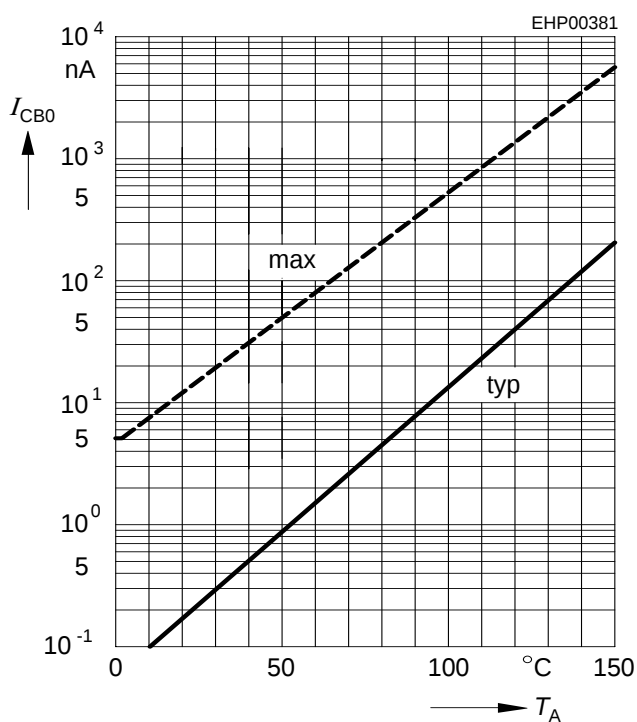
Collector-base capacitance $C_{cb} = f(V_{CB})$

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



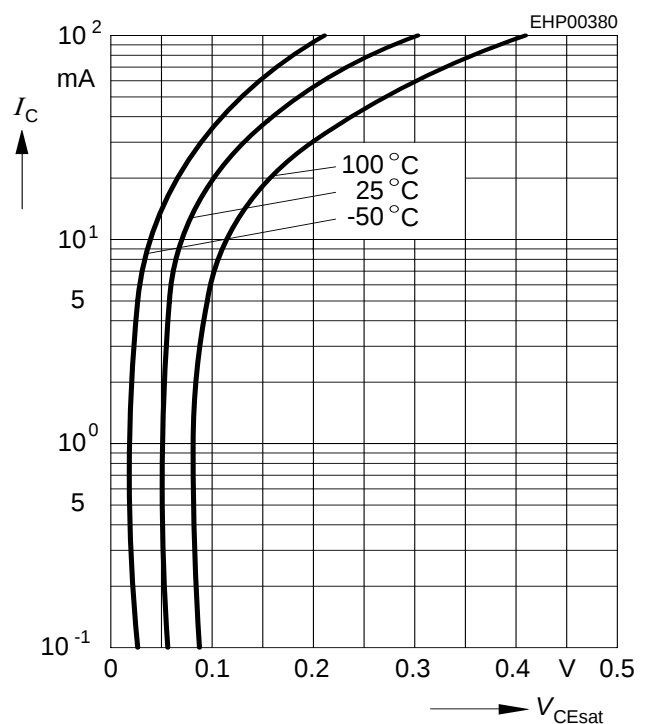
Collector cutoff current $I_{CBO} = f(T_A)$

$V_{CB} = 30V$



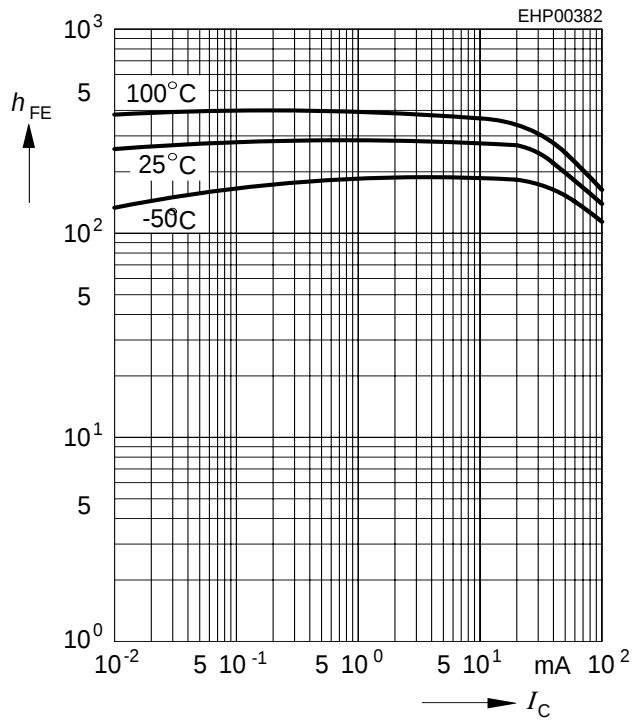
Collector-emitter saturation voltage

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



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

$V_{CE} = 5V$



Base-emitter saturation voltage

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

