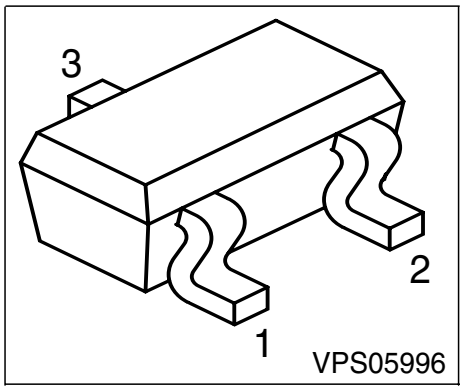
PNP Silicon AF Transistor

Preliminary data

- For AF input stages and driver applications
- High current gain
- Low collector-emitter saturation voltage
- Complementary types: BC 846T



Type	Marking	Pin Configuration			Package
BC856AT	3As	1 = B	2 = E	3 = C	SC75
BC856BT	3Bs	1 = B	2 = E	3 = C	SC75

Maximum Ratings

Parameter	Symbol	Value	Unit
Collector-emitter voltage	V_{CEO}	65	V
Collector-base voltage	V_{CBO}	80	
Collector-emitter voltage	V_{CES}	80	
Emitter-base voltage	V_{EBO}	5	
DC collector current	I_C	100	mA
Peak collector current	I_{CM}	200	mA
Total power dissipation, T_S = 109 °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

[1]For calculation of R_{thJA} please refer to Application Note Thermal Resistance

Electrical Characteristics at T_A=25°C, unless otherwise specified

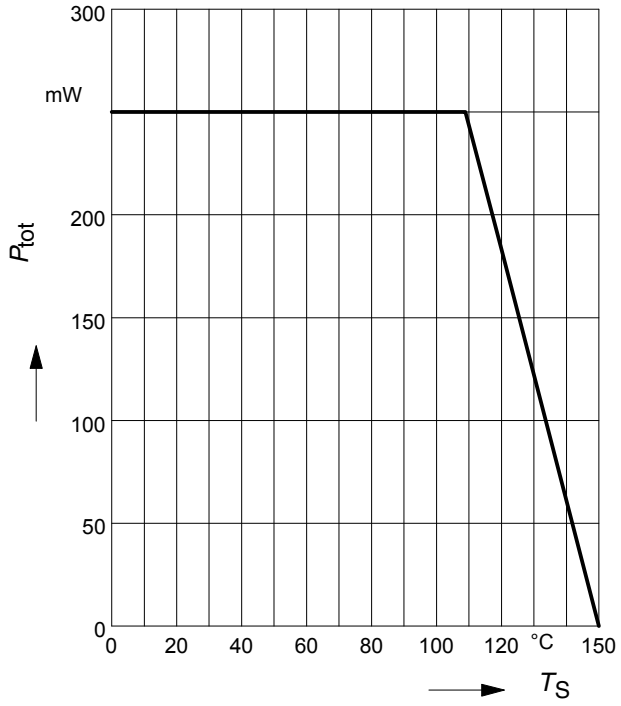
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
DC Characteristics per Transistor					
Collector-emitter breakdown voltage I_C = 10 mA, I_B = 0	$V_{(BR)CEO}$	65	-	-	V
Collector-base breakdown voltage I_C = 10 µA, I_E = 0	$V_{(BR)CBO}$	80	-	-	
Collector-emitter breakdown voltage I_C = 10 µA, V_{BE} = 0	$V_{(BR)CES}$	80	-	-	
Emitter-base breakdown voltage I_E = 10 µA, I_C = 0	$V_{(BR)EBO}$	5	-	-	
Collector cutoff current V_{CB} = 30 V, I_E = 0	I_{CBO}	-	-	15	nA
Collector cutoff current V_{CB} = 30 V, I_E = 0 , T_A = 150 °C	I_{CBO}	-	-	5	µA
DC current gain 1) I_C = 10 µA, V_{CE} = 5 V BC856AT I_C = 10 µA, V_{CE} = 5 V BC856BT I_C = 2 mA, V_{CE} = 5 V BC856AT I_C = 2 mA, V_{CE} = 5 V BC856BT	h_{FE}	 - - 125 220	 140 250 180 290	 - - 250 475	-
Collector-emitter saturation voltage1) I_C = 10 mA, I_B = 0.5 mA I_C = 100 mA, I_B = 5 mA	V_{CEsat}	 - -	 90 250	 300 650	mV
Base-emitter saturation voltage 1) I_C = 10 mA, I_B = 0.5 mA I_C = 100 mA, I_B = 5 mA	V_{BEsat}	 - -	 700 850	 - -	mV
Base-emitter voltage 1) I_C = 2 mA, V_{CE} = 5 V I_C = 10 mA, V_{CE} = 5 V	$V_{BE(ON)}$	 600 -	 650 -	 750 820	

1) Pulse test: t < 300µs; D < 2%

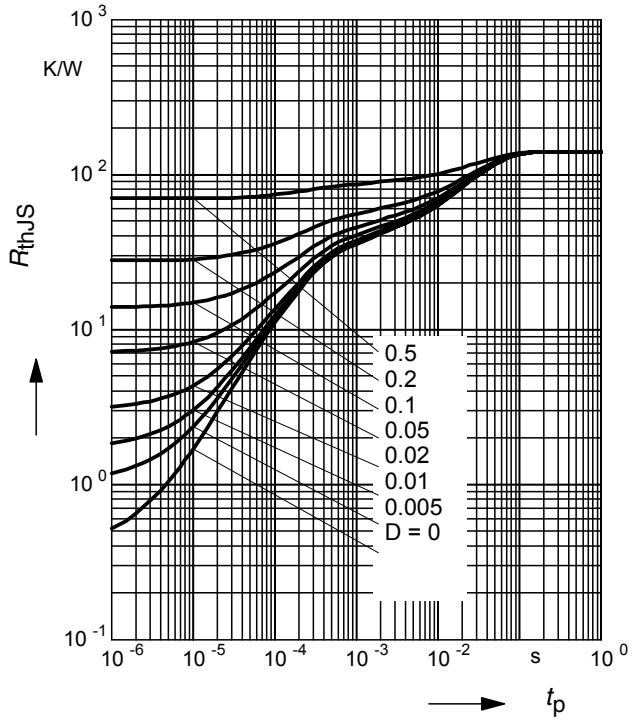
Electrical Characteristics at T_A=25°C, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
AC Characteristics per Transistor					
Transition frequency I_C = 20 mA, V_{CE} = 5 V, f = 100 MHz	f_T	-	250	-	MHz
Collector-base capacitance V_{CB} = 10 V, f = 1 MHz	C_{cb}	-	3	-	pF
Emitter-base capacitance V_{EB} = 0.5 V, f = 1 MHz	C_{eb}	-	8	-	
Short-circuit input impedance	h_{11e}				kΩ
I_C = 2 mA, V_{CE} = 5 V, f = 1 kHz BC856AT		-	2.7	-	
I_C = 2 mA, V_{CE} = 5 V, f = 1 kHz BC856BT		-	4.5	-	
Open-circuit reverse voltage transf.ratio	h_{12e}				10^{-4}
I_C = 2 mA, V_{CE} = 5 V, f = 1 kHz BC856AT		-	1.5	-	
I_C = 2 mA, V_{CE} = 5 V, f = 1 kHz BC856BT		-	2	-	
Short-circuit forward current transf.ratio	h_{21e}				-
I_C = 2 mA, V_{CE} = 5 V, f = 1 kHz BC856AT		-	200	-	
I_C = 2 mA, V_{CE} = 5 V, f = 1 kHz BC856BT		-	330	-	
Open-circuit output admittance	h_{22e}				µS
I_C = 2 mA, V_{CE} = 5 V, f = 1 kHz BC856AT		-	18	-	
I_C = 2 mA, V_{CE} = 5 V, f = 1 kHz BC856BT		-	30	-	

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

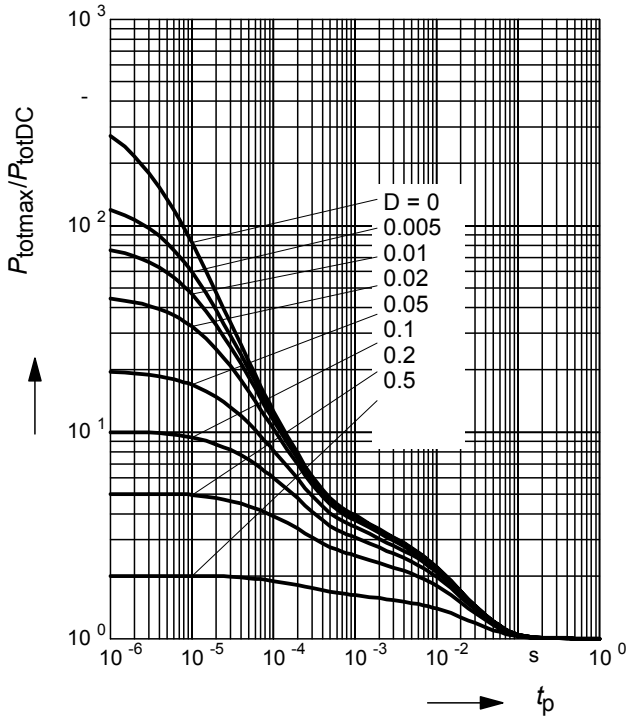


Permissible Pulse Load $R_{thJS} = f(t_p)$

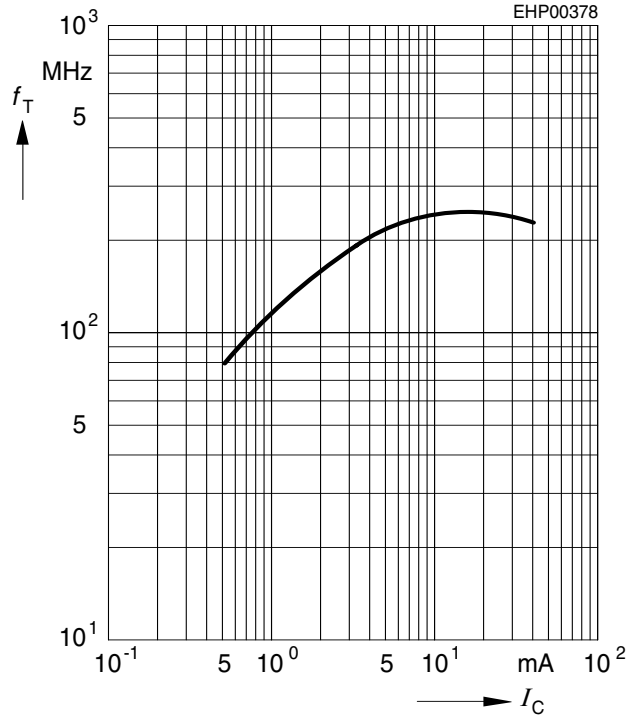


Permissible Pulse Load

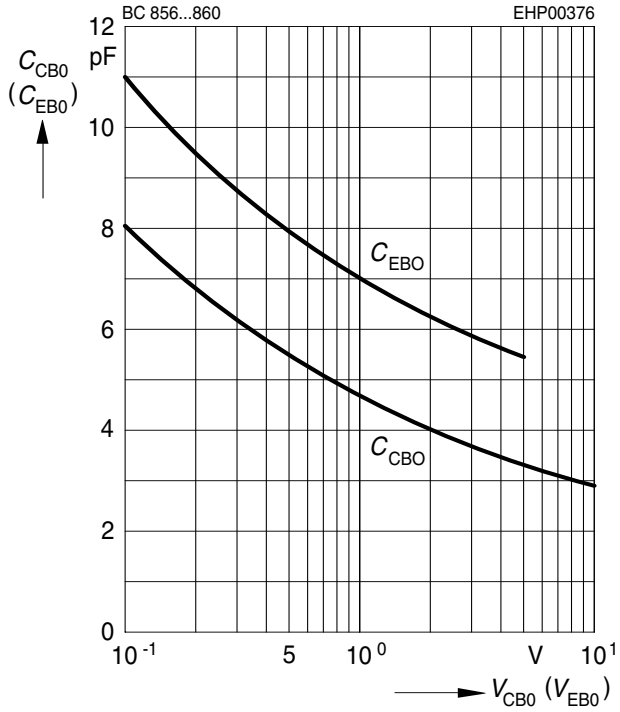
$P_{totmax} / P_{totDC} = f(t_p)$



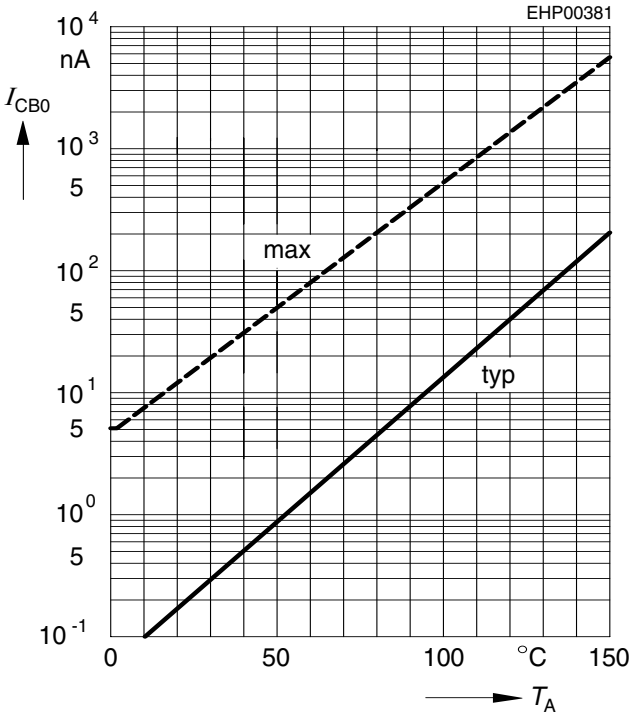
Transition frequency $f_T = f(I_C)$
V_{CE} = 5V



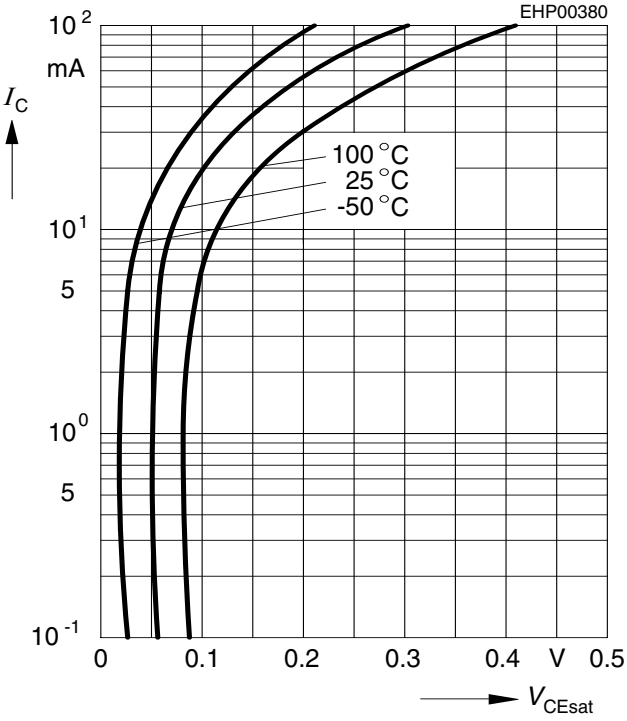
Collector-base capacitance $C_{CB} = f(V_{CBO}$
Emitter-base capacitance $C_{EB} = f(V_{EBO})$



Collector cutoff current $I_{CBO} = f(T_A)$
V_{CB} = 30V

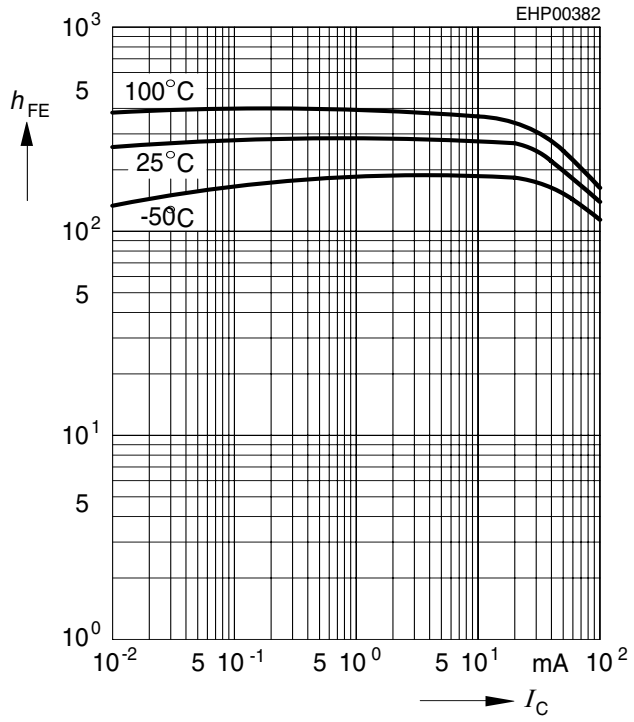


Collector-emitter saturation voltage
$I_C = f(V_{CEsat})$, h_{FE} = 20



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

V_{CE} = 5V



Base-emitter saturation voltage

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