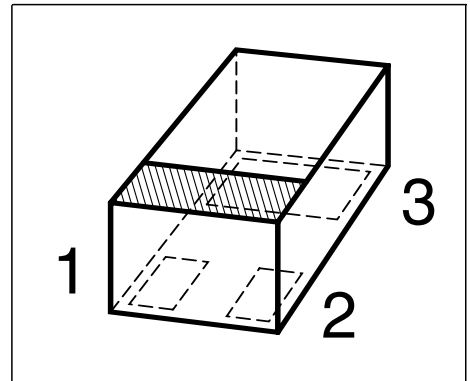


PNP Silicon AF Transistors

Preliminary data

- For AF input stages and driver applications
- High current gain
- Low collector-emitter saturation voltage
- Complementary types: BC847BL3,
BC848BL3 (NPN)



Type	Marking	Pin Configuration			Package
BC857BL3	3F	1 = B	2 = E	3 = C	TSLP-3-1
BC858BL3	3K	1 = B	2 = E	3 = C	TSLP-3-1

Maximum Ratings

Parameter	Symbol	Value	Unit
Collector-emitter voltage	V_{CEO}		V
BC857BL3		45	
BC858BL3		30	
Collector-emitter voltage	V_{CES}		
BC857BL3		50	
BC858BL3		30	
Collector-base voltage	V_{CBO}		
BC857BL3		50	
BC858BL3		30	
Emitter-base voltage	V_{EBO}		
BC857BL3		5	
BC858BL3		5	
Collector current	I_C	100	mA
Peak collector current	I_{CM}	200	
Total power dissipation	P_{tot}	250	mW
$T_S \leq 138^\circ\text{C}$			
Junction temperature	T_j	150	$^\circ\text{C}$
Storage temperature	T_{stg}	-65 ... 150	

Thermal Resistance

Parameter	Symbol	Value	Unit
Junction - soldering point ¹⁾	R_{thJS}	≤ 50	K/W

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

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

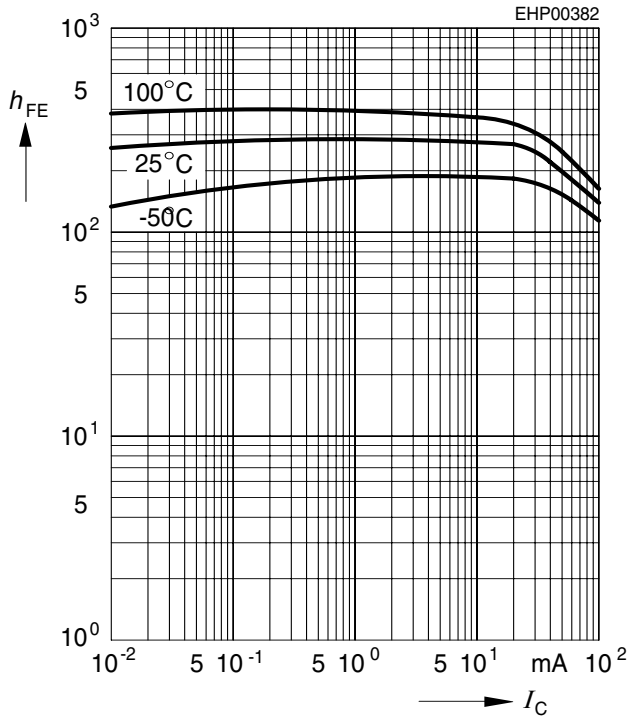
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
DC Characteristics					
Collector-emitter breakdown voltage $I_C = 10\text{ mA}$, $I_B = 0$, BC857BL3 $I_C = 10\text{ mA}$, $I_B = 0$, BC858BL3	$V_{(BR)CEO}$	45 30	- -	- -	V
Collector-base breakdown voltage $I_C = 10\text{ }\mu\text{A}$, $I_E = 0$, BC857BL3 $I_C = 10\text{ }\mu\text{A}$, $I_E = 0$, BC858BL3	$V_{(BR)CBO}$	50 30	- -	- -	
Collector-emitter breakdown voltage $I_C = 10\text{ }\mu\text{A}$, $V_{BE} = 0$, BC857BL3 $I_C = 10\text{ }\mu\text{A}$, $V_{BE} = 0$, BC858BL3	$V_{(BR)CES}$	50 30	- -	- -	
Emitter-base breakdown voltage $I_E = 0$, $I_C = 1\text{ }\mu\text{A}$	$V_{(BR)EBO}$	5	-	-	
Collector-base cutoff current $V_{CB} = 30\text{ V}$, $I_E = 0$ $V_{CB} = 30\text{ V}$, $I_E = 0$, $T_A = 150\text{ }^{\circ}\text{C}$	I_{CBO}	- -	- -	15 5	
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}	- 220	250 290	- 475	
Collector-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_{CEsat}	- -	75 250	300 650	mV
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- ¹⁾ $I_C = 2\text{ mA}$, $V_{CE} = 5\text{ V}$ $I_C = 10\text{ mA}$, $V_{CE} = 5\text{ V}$	$V_{BE(ON)}$	600 -	650 -	750 820	

AC Characteristics

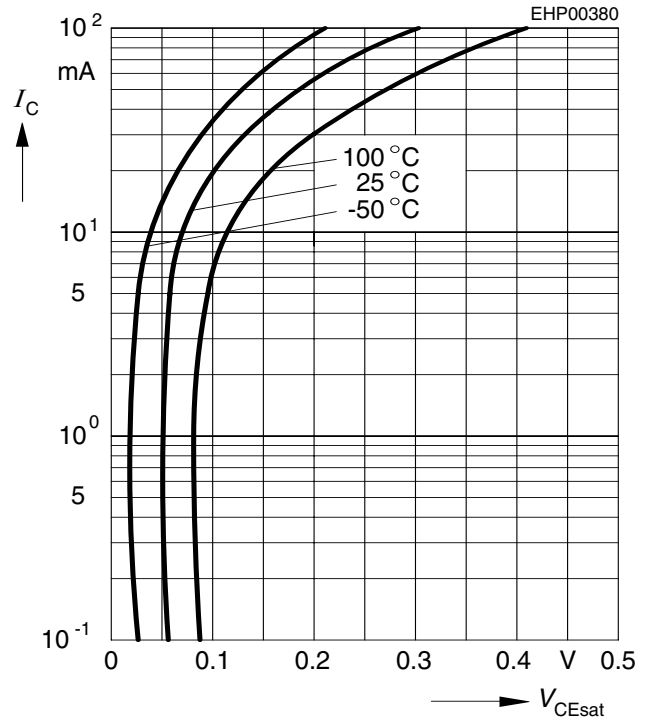
Transition frequency $I_C = 20 \text{ mA}$, $V_{CE} = 5 \text{ V}$, $f = 100 \text{ MHz}$	f_T	-	250	-	MHz
Collector-base capacitance $V_{CB} = 10 \text{ V}$, $f = 1 \text{ MHz}$	C_{cb}	-	3	-	pF
Emitter-base capacitance $V_{EB} = 0.5 \text{ V}$, $f = 1 \text{ MHz}$	C_{eb}	-	8	-	
Short-circuit input impedance $I_C = 2 \text{ mA}$, $V_{CE} = 5 \text{ V}$, $f = 1 \text{ kHz}$	h_{11e}	-	4.5	-	k Ω
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	-	μS

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

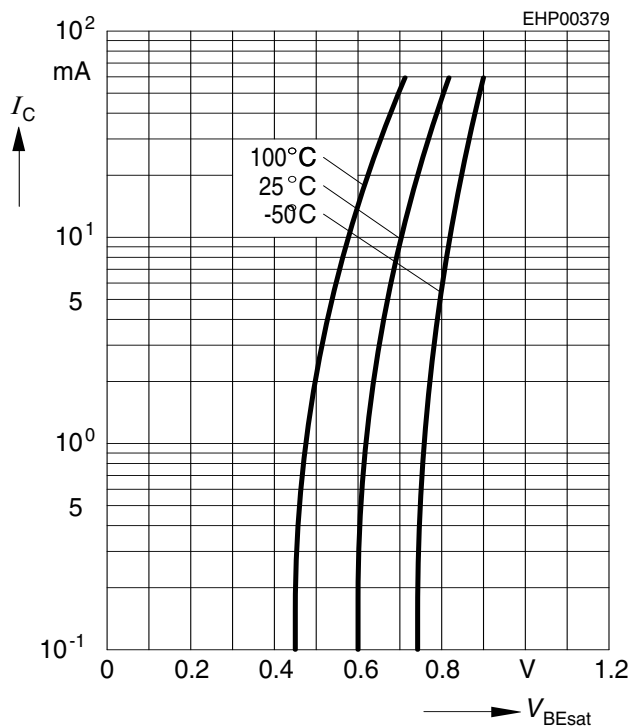
$$V_{CE} = 5 \text{ V}$$


Collector-emitter saturation voltage

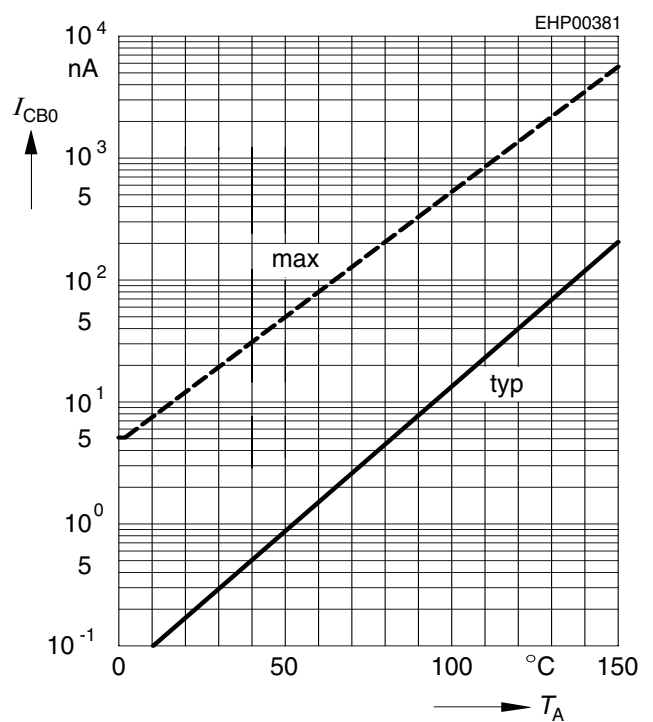
$$I_C = f(V_{CEsat}), h_{FE} = 20$$


Base-emitter saturation voltage

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

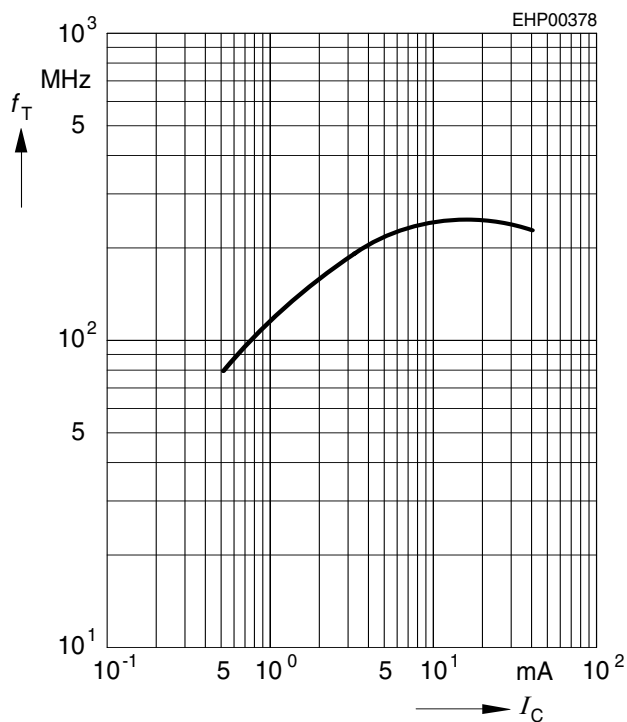

Collector cutoff current $I_{CBO} = f(T_A)$

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



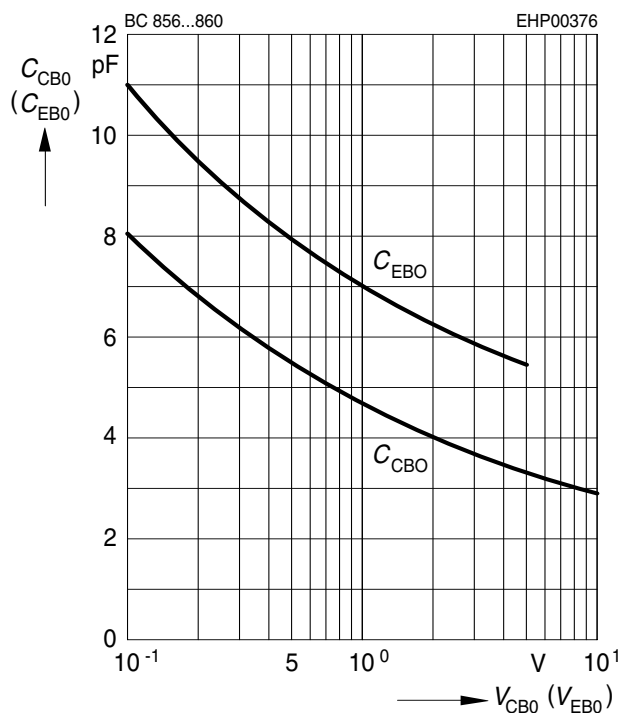
Transition frequency $f_T = f(I_C)$

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



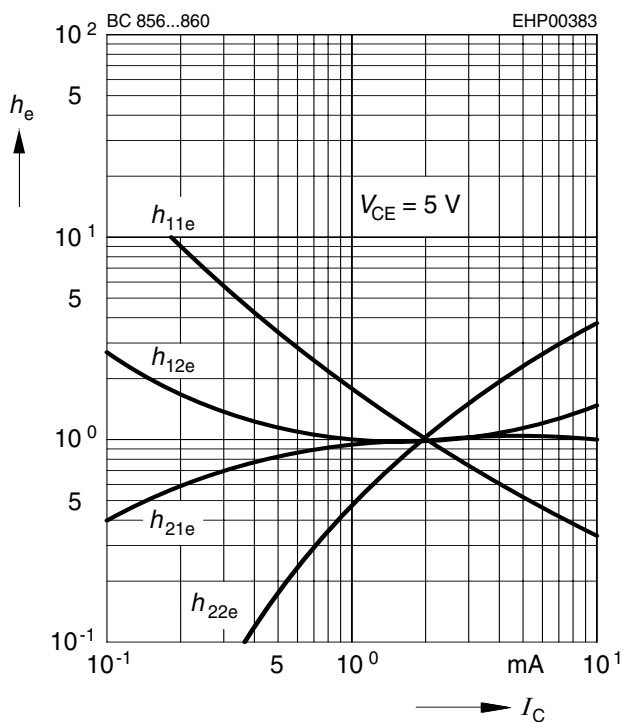
Collector-base capacitance $C_{CB} = f(V_{CB0})$

Emitter-base capacitance $C_{EB} = f(V_{EB0})$



h parameter $h_e = f(I_C)$ normalized

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



h parameter $h_e = f(V_{CE})$ normalized

$I_C = 2\text{ mA}$

