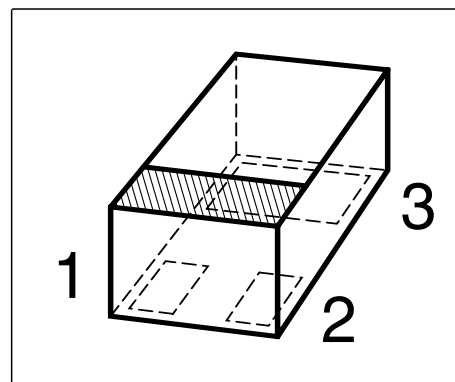


NPN Silicon AF Transistor

Preliminary data

- For AF input stage and driver applications
- High current gain
- Low collector-emitter saturation voltage
- complementary types: BC 857BL3,

BC 858BL3 (PNP)



Type	Marking	Pin Configuration			Package
BC 847BL3	1F	1 = B	2 = E	3 = C	TSLP-3
BC 848BL3	1K	1 = B	2 = E	3 = C	TSLP-3

Maximum Ratings

Parameter	Symbol	Value	Unit
Collector-emitter voltage	V_{CEO}	45	V
BC 847BL3		30	
Collector-emitter voltage	V_{CES}	50	
BC 847BL3		30	
Collector-base voltage	V_{CBO}	50	
BC 847BL3		30	
Emitter-base voltage	V_{EBO}	6	
BC 847BL3		5	
Collector current	I_C	100	mA
Peak collector current	I_{CM}	200	
Total power dissipation- $T_S = tbd$	P_{tot}	250	mW
Junction temperature	T_j	150	°C

Thermal Resistance

Parameter	Symbol	Value	Unit
Junction ambient-	R_{thJA}	tbd	K/W
Junction - soldering point	R_{thJS}	tbd	

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 $I_C = 10\text{ mA}$, $I_B = 0$, BC 847BL3 $I_C = 10\text{ mA}$, $I_B = 0$, BC 848BL3	$V_{(BR)CEO}$	45 30	- -	- -	V
Collector-base breakdown voltage $I_C = 10\text{ }\mu\text{A}$, $I_B = 0$, BC 847BL3 $I_C = 10\text{ }\mu\text{A}$, $I_B = 0$, BC 848BL3	$V_{(BR)CBO}$	50 30	- -	- -	V V
Collector-emitter breakdown voltage $I_C = 10\text{ }\mu\text{A}$, $V_{BE} = 0$, BC 847BL3 $I_C = 10\text{ }\mu\text{A}$, $V_{BE} = 0$, BC 848BL3	$V_{(BR)CES}$	50 30	- -	- -	V -
Emitter-base breakdown voltage $I_E = 1\text{ }\mu\text{A}$, $I_C = 0$, BC 847BL3 $I_E = 1\text{ }\mu\text{A}$, $I_C = 0$, BC 848BL3	$V_{(BR)EBO}$	6 5	- -	- -	V V
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	nA μA
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 ¹⁾ $I_C = 10\text{ mA}$, $I_B = 0.5\text{ mA}$ $I_C = 100\text{ mA}$, $I_B = 5\text{ mA}$	V_{CEsat}	- -	90 200	250 600	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}	- -	700 900	- -	
Base-emitter voltage- ¹⁾ $I_C = 2\text{ mA}$, $V_{CE} = 5\text{ V}$ $I_C = 10\text{ mA}$, $V_{CE} = 5\text{ V}$	$V_{BE(ON)}$	580 -	660 -	700 770	

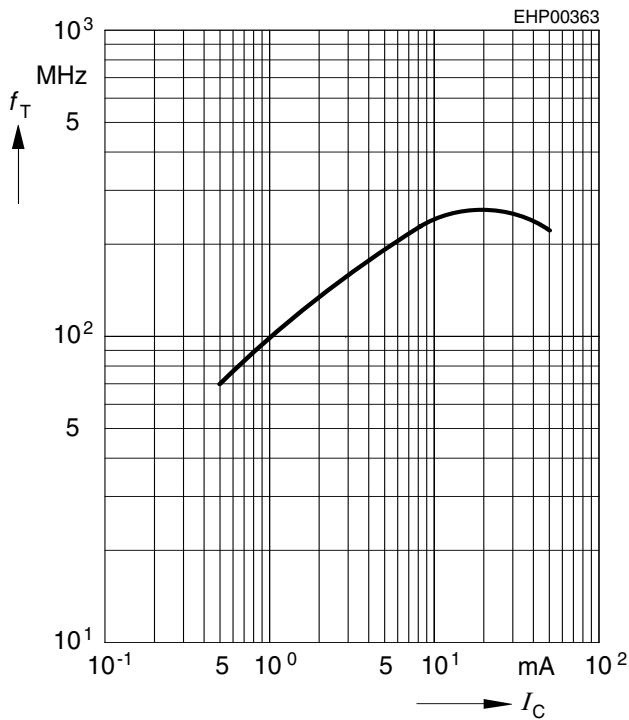
¹⁾Pulse test: $t = 300\mu\text{s}$, $D = 2\%$

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

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
AC Characteristics					
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}	-	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	-	kΩ
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

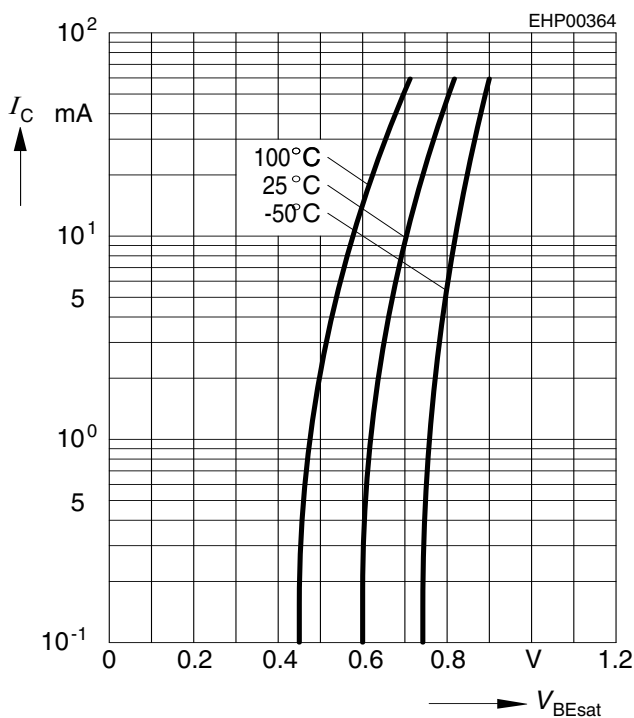
Transition frequency $f_T = f(I_C)$

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



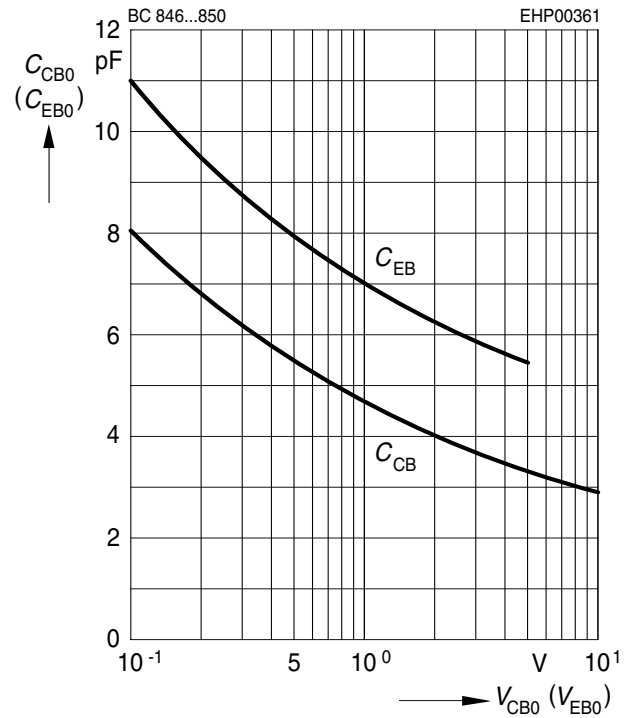
Base-emitter saturation voltage

$I_C = f(V_{BEsat}), h_{FE} = 10$



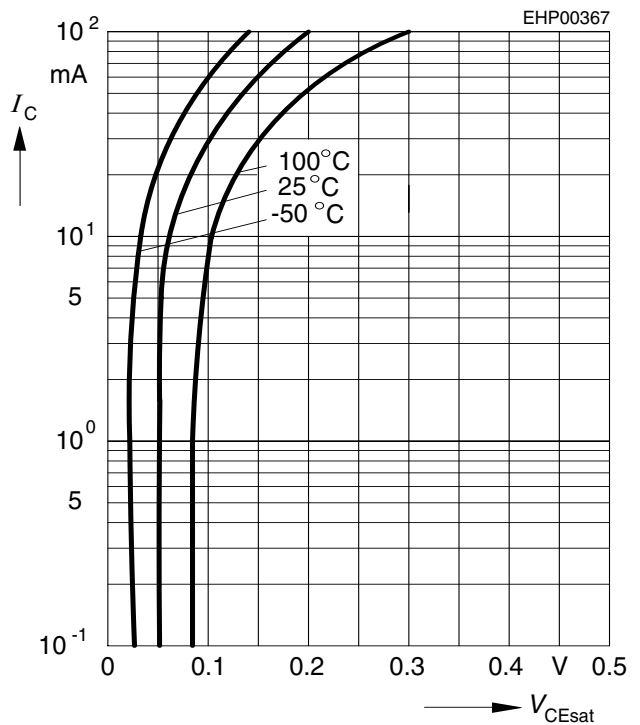
Collector-base capacitance $C_{CB} = f(V_{CB0})$

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



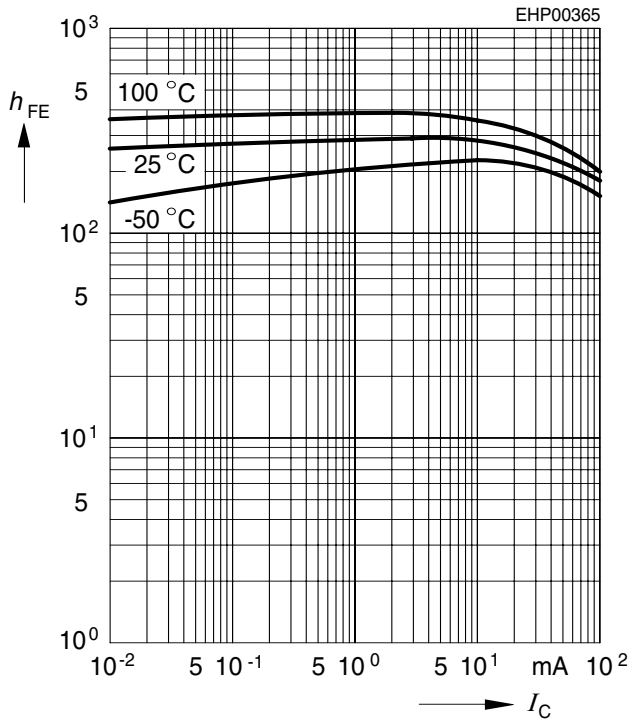
Collector-emitter saturation voltage

$I_C = f(V_{CEsat}), h_{FE} = 10$



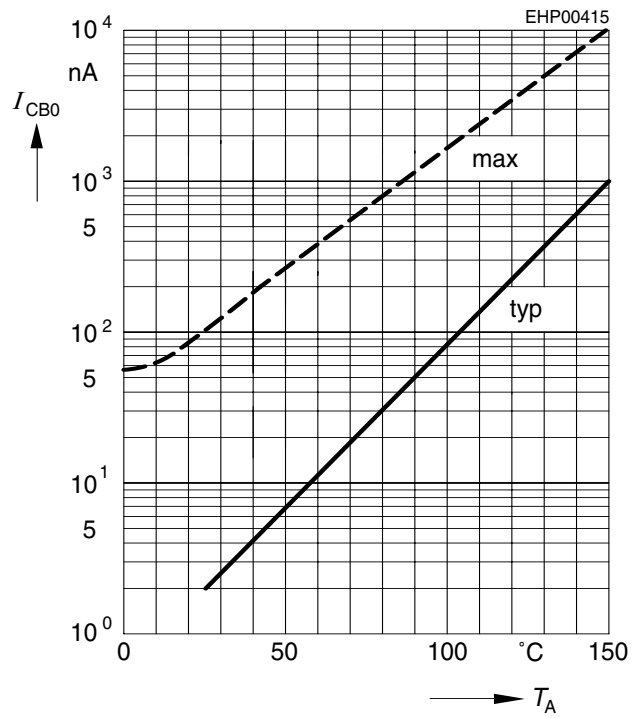
DC current gain $h_{FE} = f(I_C)$

$V_{CE} = 1 \text{ V}$



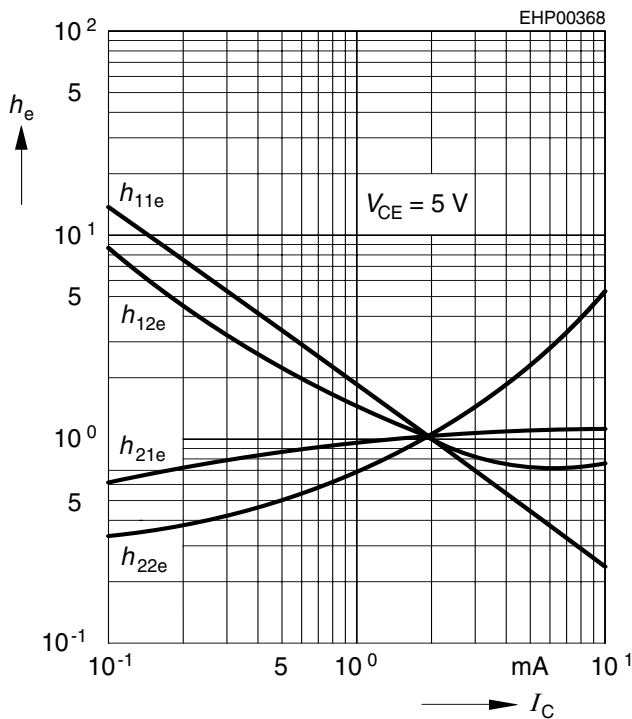
Collector cutoff current $I_{CBO} = f(T_A)$

$V_{CBO} = 25 \text{ V}$



h parameter $h_e = f(I_C)$ normalized

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



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

$I_C = 2 \text{ mA}$

