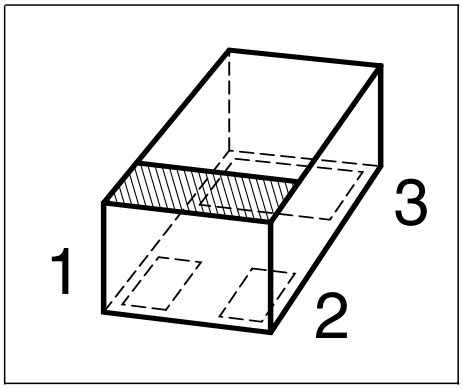
NPN Silicon AF Transistor

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}		V
BC 847BL3		45	
BC 848BL3		30	
Collector-emitter voltage	V_{CES}		
BC 847BL3		50	
BC 848BL3		30	
Collector-base voltage	V_{CBO}		
BC 847BL3		50	
BC 848BL3		30	
Emitter-base voltage	V_{EBO}		
BC 847BL3		6	
BC 848BL3		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°C, unless otherwise specified

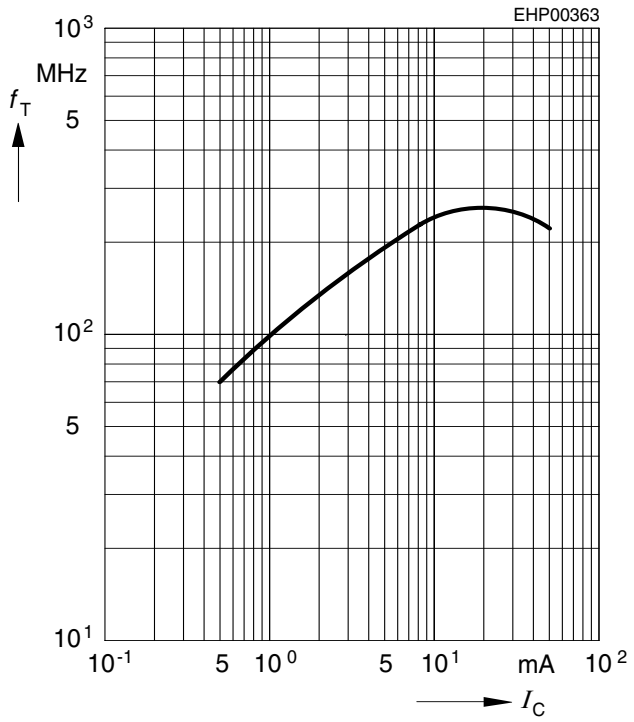
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
DC Characteristics					
Collector-emitter breakdown voltage	$V_{(BR)CEO}$				V
I_C = 10 mA, I_B = 0 , BC 847BL3		45	-	-	
I_C = 10 mA, I_B = 0 , BC 848BL3		30	-	-	
Collector-base breakdown voltage	$V_{(BR)CBO}$				
I_C = 10 µA, I_B = 0 , BC 847BL3		50	-	-	V
I_C = 10 µA, I_B = 0 , BC 848BL3		30	-	-	V
Collector-emitter breakdown voltage	$V_{(BR)CES}$				
I_C = 10 µA, V_{BE} = 0 , BC 847BL3		50	-	-	V
I_C = 10 µA, V_{BE} = 0 , BC 848BL3		30	-	-	-
Emitter-base breakdown voltage	$V_{(BR)EBO}$				
I_E = 1 µA, I_C = 0 , BC 847BL3		6	-	-	V
I_E = 1 µA, I_C = 0 , BC 848BL3		5	-	-	V
Collector -base cutoff current	I_{CBO}				
V_{CB} = 30 V, I_E = 0		-	-	15	nA
V_{CB} = 30 V, I_E = 0 , T_A = 150 °C		-	-	5	µA
DC current gain-	h_{FE}				-
I_C = 10 µA, V_{CE} = 5 V		-	250	-	
I_C = 2 mA, V_{CE} = 5 V		200	290	450	
Collector-emitter saturation voltage[1)]	V_{CEsat}				
I_C = 10 mA, I_B = 0.5 mA		-	90	250	mV
I_C = 100 mA, I_B = 5 mA		-	200	600	
Base emitter saturation voltage-[1)]	V_{BEsat}				
I_C = 10 mA, I_B = 0.5 mA		-	700	-	
I_C = 100 mA, I_B = 5 mA		-	900	-	
Base-emitter voltage-[1)]	$V_{BE(ON)}$				
I_C = 2 mA, V_{CE} = 5 V		580	660	700	
I_C = 10 mA, V_{CE} = 5 V		-	-	770	

[1]Pulse test: t 300µs, D = 2%

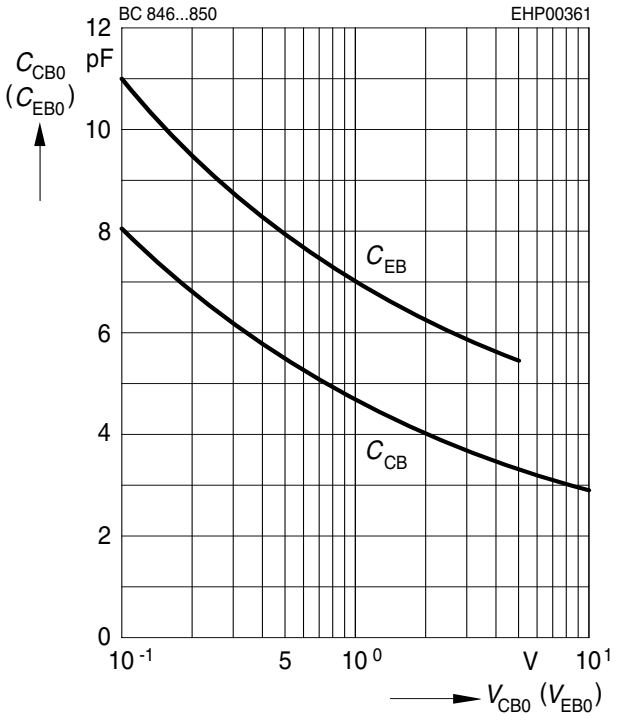
Electrical Characteristics at T_A = 25°C, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
AC Characteristics					
Transition frequency I_C = 10 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 I_C = 2 mA, V_{CE} = 5 V, f = 1 kHz	h_{11e}	-	4.5	-	kΩ
Open-circuit reverse voltage transf. ratio I_C = 2 mA, V_{CE} = 5 V, f = 1 kHz	h_{12e}	-	2	-	10^{-4}
Short-circuit forward current transf. ratio I_C = 2 mA, V_{CE} = 5 V, f = 1 kHz	h_{21e}	-	330	-	-
Open-circuit output admittance I_C = 2 mA, V_{CE} = 5 V, f = 1 kHz	h_{22e}	-	30	-	µS

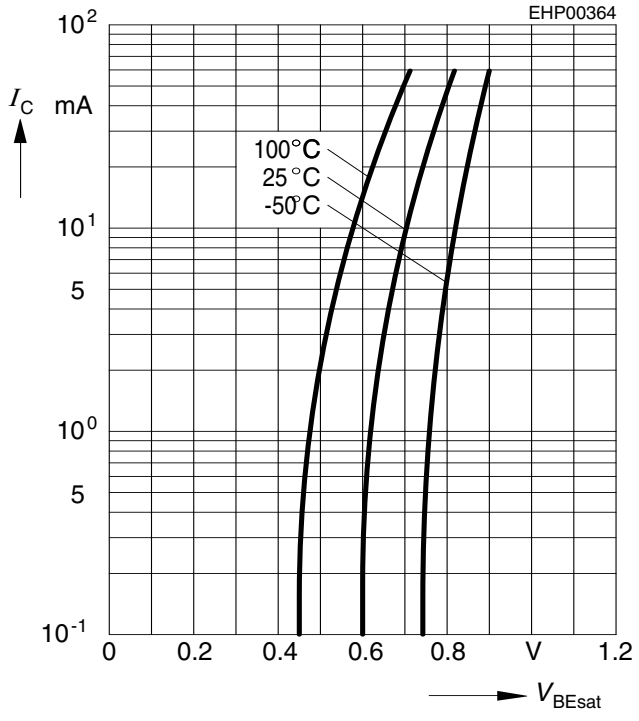
Transition frequency $f_T = f(I_C)$
V_{CE} = 5 V



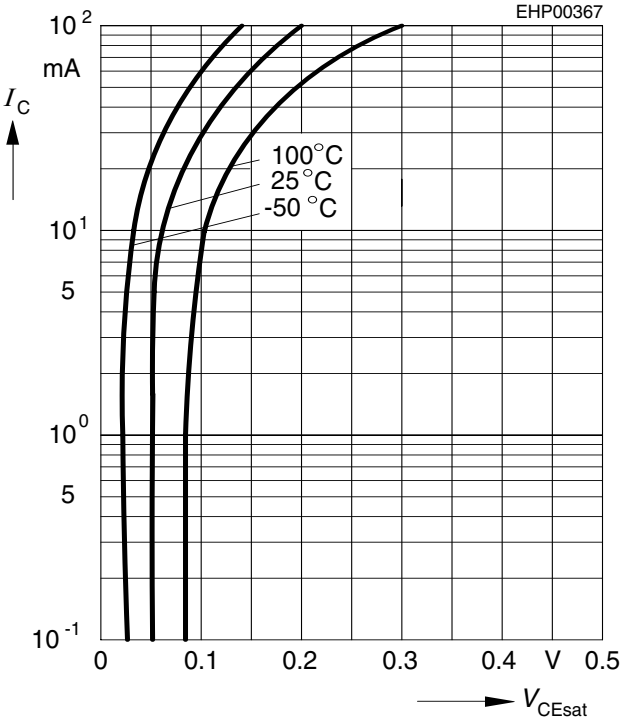
Collector-base capacitance $C_{CB} = f(V_{CB0})$
Emitter-base capacitance $C_{EB} = f(V_{EB0})$



Base-emitter saturation voltage
$I_C = f(V_{BEsat})$, h_{FE} = 10

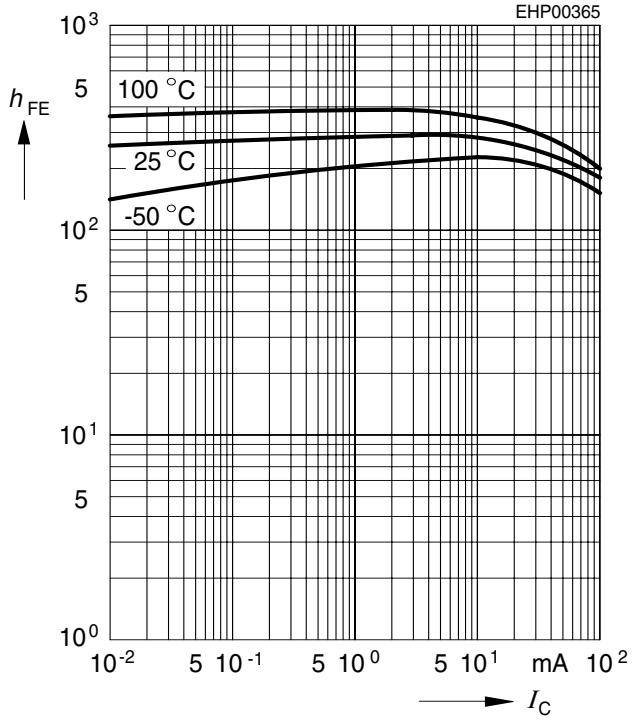


Collector-emitter saturation voltage
$I_C = f(V_{CEsat})$, h_{FE} = 10



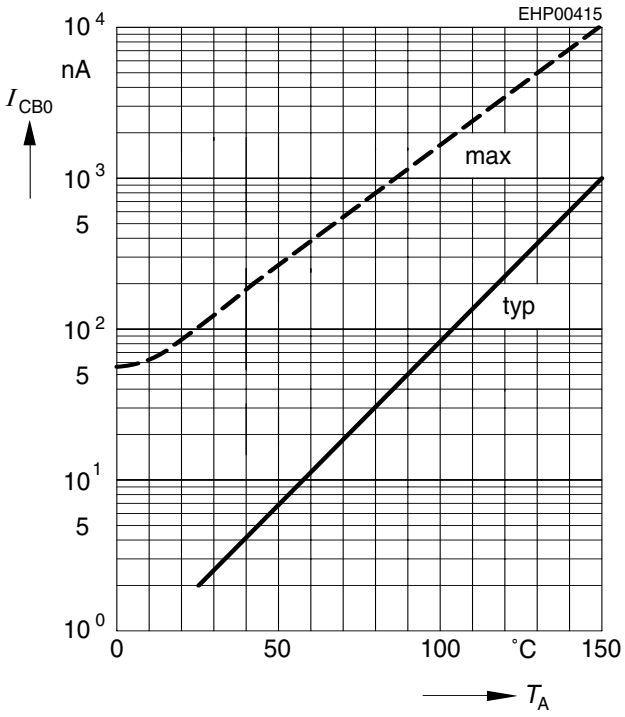
DC current gain $h_{FE} = f(I_C)$

V_{CE} = 1 V



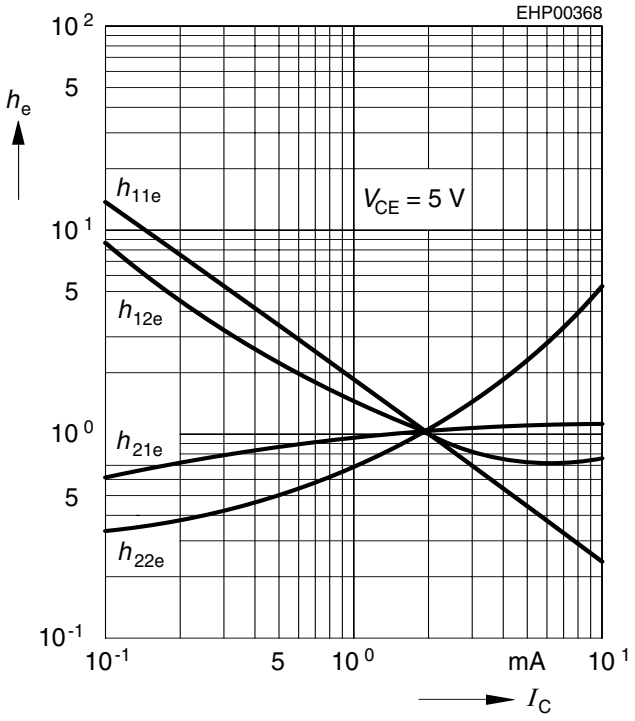
Collector cutoff current $I_{CBO} = f(T_A)$

V_{CBO} = 25 V



h parameter $h_e = f(I_C)$ **normalized**

V_{CE} = 5V



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

I_C = 2mA