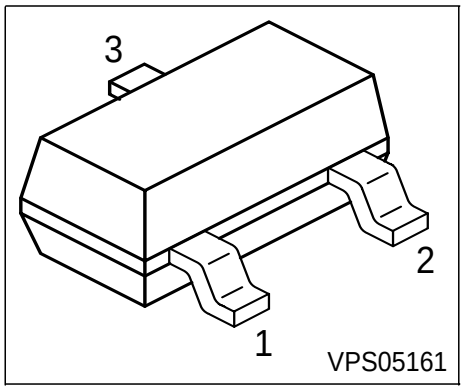
PNP Silicon AF Transistors

- For AF input stages and driver applications
- High current gain
- Low collector-emitter saturation voltage
- Low noise between 30 Hz and 15 kHz
- Complementary types: BC846, BC847, BC848
  BC849, BC850 (NPN)



Type	Marking	Pin Configuration			Package
BC856A	3As	1 = B	2 = E	3 = C	SOT23
BC856B	3Bs	1 = B	2 = E	3 = C	SOT23
BC857A	3Es	1 = B	2 = E	3 = C	SOT23
BC857B	3Fs	1 = B	2 = E	3 = C	SOT23
BC857C	3Gs	1 = B	2 = E	3 = C	SOT23
BC858A	3Js	1 = B	2 = E	3 = C	SOT23
BC858B	3Ks	1 = B	2 = E	3 = C	SOT23
BC858C	3Ls	1 = B	2 = E	3 = C	SOT23
BC859B	4Bs	1 = B	2 = E	3 = C	SOT23
BC859C	4Cs	1 = B	2 = E	3 = C	SOT23
BC860B	4Fs	1 = B	2 = E	3 = C	SOT23

Maximum Ratings

Parameter	Symbol	BC856	BC857 BC860	BC858 BC859	Unit
Collector-emitter voltage	V_{CEO}	65	45	30	V
Collector-base voltage	V_{CBO}	80	50	30	
Collector-emitter voltage	V_{CES}	80	50	30	
Emitter-base voltage	V_{EBO}	5	5	5	
DC collector current	I_C	100			mA
Peak collector current	I_{CM}	200			mA
Peak base current	I_{BM}	200			
Peak emitter current	I_{EM}	200			
Total power dissipation, T_S = 71 °C	P_{tot}	330			mW
Junction temperature	T_j	150			°C
Storage temperature	T_{stg}	-65 ... 150			

Thermal Resistance

Junction - soldering point[1)]	R_{thJS}	≤240	K/W

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	BC856		65	-	-	
	BC857/860		45	-	-	
	BC858/859		30	-	-	
Collector-base breakdown voltage		$V_{(BR)CBO}$				
I_C = 10 µA, I_E = 0	BC856		80	-	-	
	BC857/860		50	-	-	
	BC858/859		30	-	-	

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

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

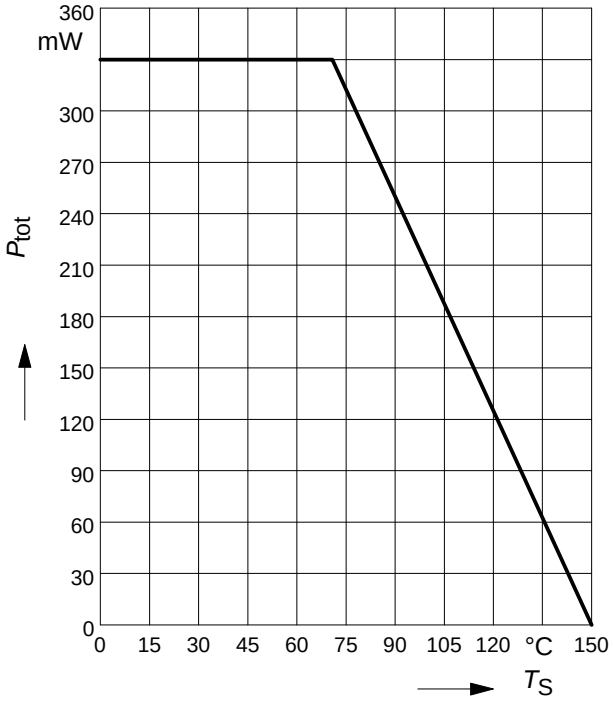
Parameter		Symbol	Values			Unit
			min.	typ.	max.	
DC Characteristics						
Collector-emitter breakdown voltage		$V_{(BR)CES}$				V
I_C = 10 µA, V_{BE} = 0	BC856		80	-	-	
	BC857/860		50	-	-	
	BC858/859		30	-	-	
Emitter-base breakdown voltage		$V_{(BR)EBO}$	5	-	-	
I_E = 1 µA, I_C = 0						
Collector cutoff current		I_{CBO}	-	-	15	nA
V_{CB} = 30 V, I_E = 0						
Collector cutoff current		I_{CBO}	-	-	5	µA
V_{CB} = 30 V, I_E = 0 , T_A = 150 °C						
DC current gain 1)		h_{FE}				-
I_C = 10 µA, V_{CE} = 5 V	h_{FE}-group **A**		-	140	-	
	h_{FE}-group **B**		-	250	-	
	h_{FE}-group **C**		-	480	-	
DC current gain 1)		h_{FE}				
I_C = 2 mA, V_{CE} = 5 V	h_{FE}-group **A**		125	180	250	
	h_{FE}-group **B**		220	290	475	
	h_{FE}-group **C**		420	520	800	
Collector-emitter saturation voltage1)		V_{CEsat}				mV
I_C = 10 mA, I_B = 0.5 mA			-	75	300	
I_C = 100 mA, I_B = 5 mA			-	250	650	
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			-	850	-	
Base-emitter voltage 1)		$V_{BE(ON)}$				
I_C = 2 mA, V_{CE} = 5 V			600	650	750	
I_C = 10 mA, V_{CE} = 5 V			-	-	820	

1) Pulse test: t ≤ 300µs, D = 2%

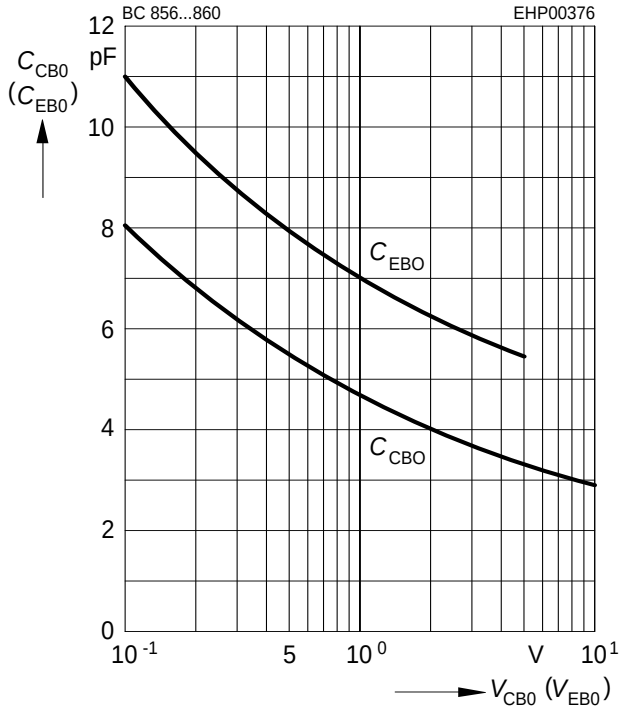
Electrical Characteristics at T_A = 25°C, unless otherwise specified.

Parameter		Symbol	Values			Unit
			min.	typ.	max.	
AC Characteristics						
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	h_{FE}-gr.**A**		-	2.7	-	
	h_{FE}-gr.**B**		-	4.5	-	
	h_{FE}-gr.**C**		-	8.7	-	
Open-circuit reverse voltage transf.ratio		h_{12e}				10^{-4}
I_C = 2 mA, V_{CE} = 5 V, f = 1 kHz	h_{FE}-gr.**A**		-	1.5	-	
	h_{FE}-gr.**B**		-	2	-	
	h_{FE}-gr.**C**		-	3	-	
Short-circuit forward current transf.ratio		h_{21e}				-
I_C = 2 mA, V_{CE} = 5 V, f = 1 kHz	h_{FE}-gr.**A**		-	200	-	
	h_{FE}-gr.**B**		-	330	-	
	h_{FE}-gr.**C**		-	600	-	
Open-circuit output admittance		h_{22e}				µS
I_C = 2 mA, V_{CE} = 5 V, f = 1 kHz	h_{FE}-gr.**A**		-	18	-	
	h_{FE}-gr.**B**		-	30	-	
	h_{FE}-gr.**C**		-	60	-	
Noise figure		F	-	1	4	dB
I_C = 0.2 mA, V_{CE} = 5 V, R_S = 2 kΩ,	BC 859					
f = 1 kHz, Δ f = 200 Hz	BC 860					
Equivalent noise voltage		V_n	-	-	0.11	µV
I_C = 200 µA, V_{CE} = 5 V, R_S = 2 kΩ,	BC 860					
f = 10 ... 50 Hz						

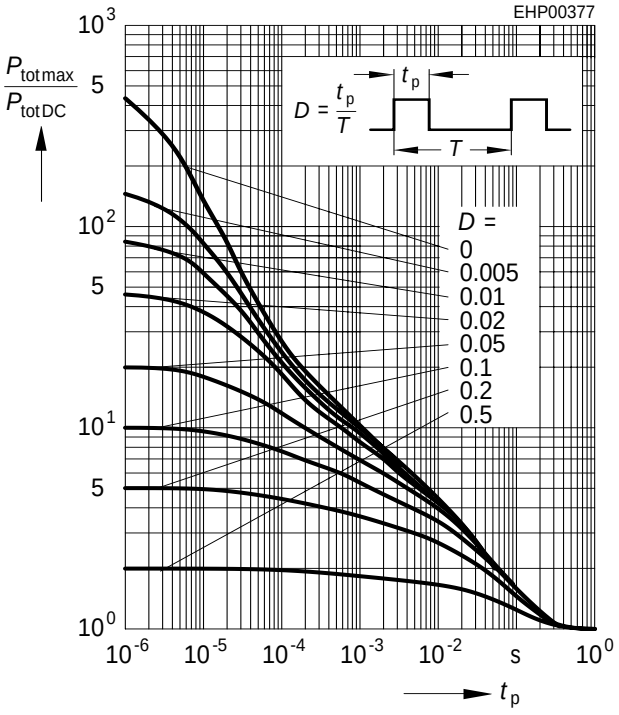
Total power dissipation $P_{tot} = f(T_S)$



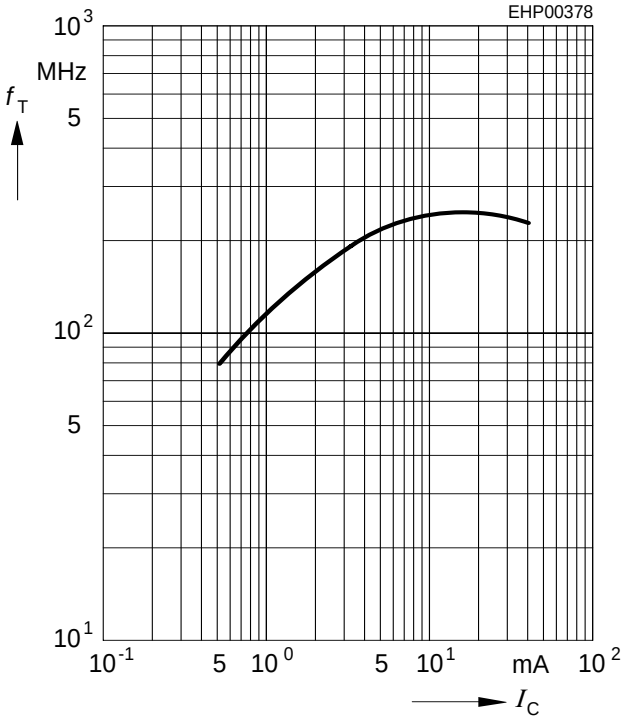
Collector-base capacitance $C_{CB} = f(V_{CBO})$
Emitter-base capacitance $C_{EB} = f(V_{EBO})$



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

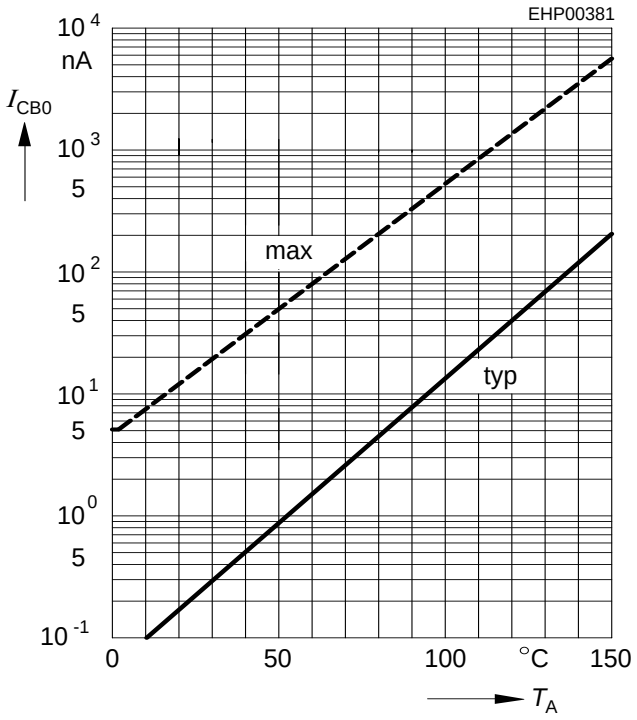


Transition frequency $f_T = f(I_C)$
$V_{CE} = 5V$



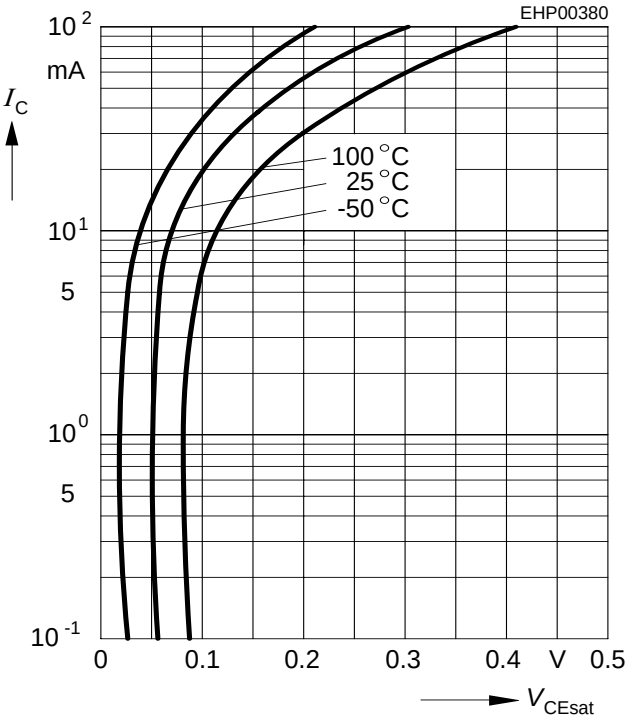
Collector cutoff current $I_{CBO} = f(T_A)$

V_{CB} = 30V



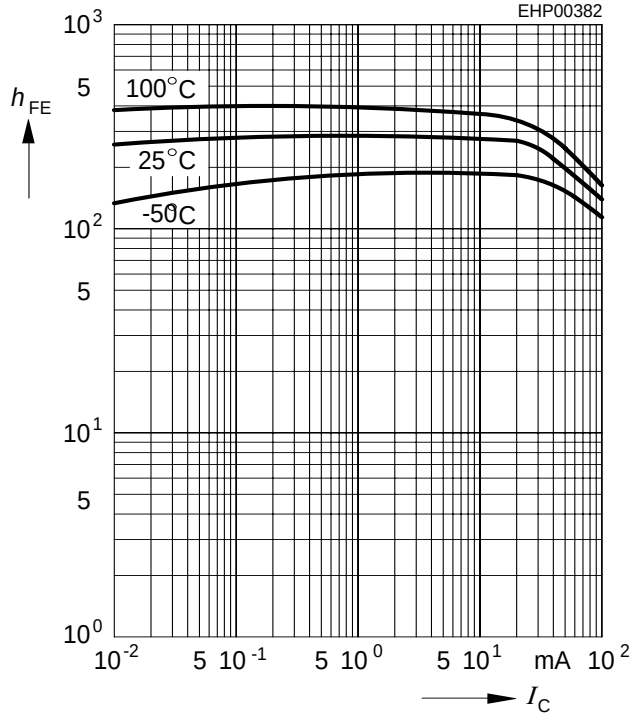
Collector-emitter saturation voltage

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



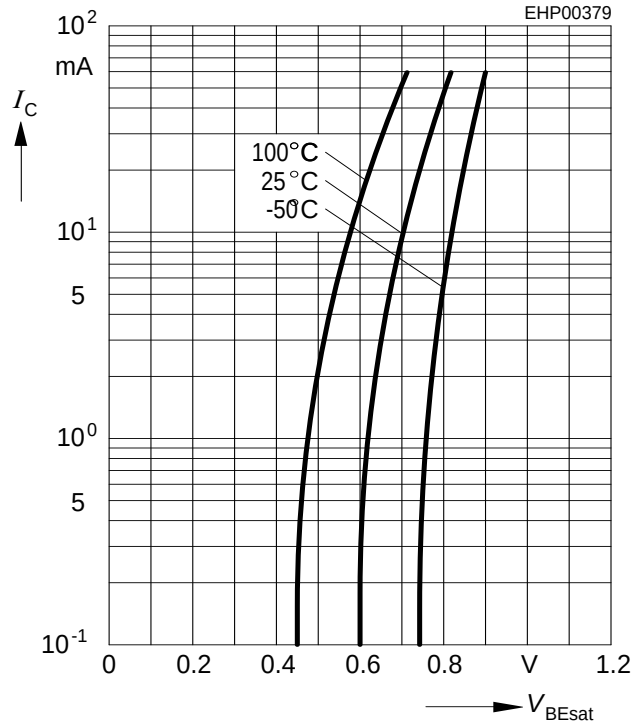
DC current gain $h_{FE} = f(I_C)$

V_{CE} = 5V



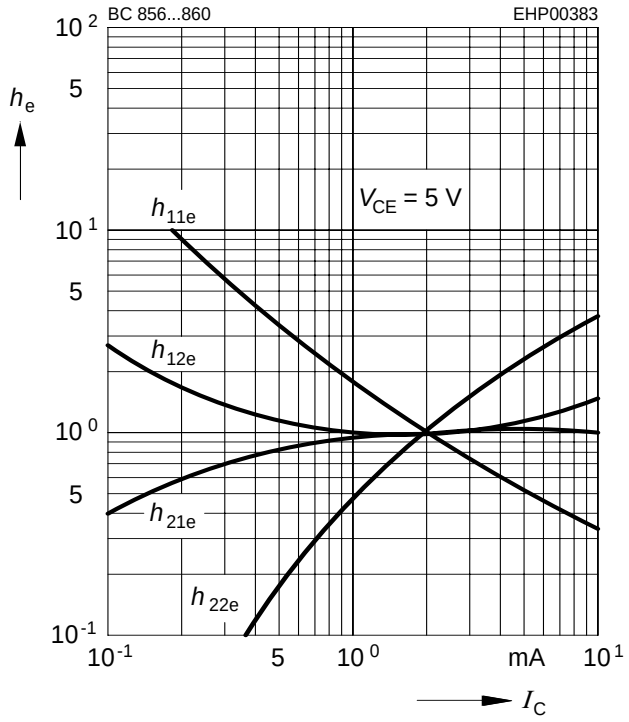
Base-emitter saturation voltage

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



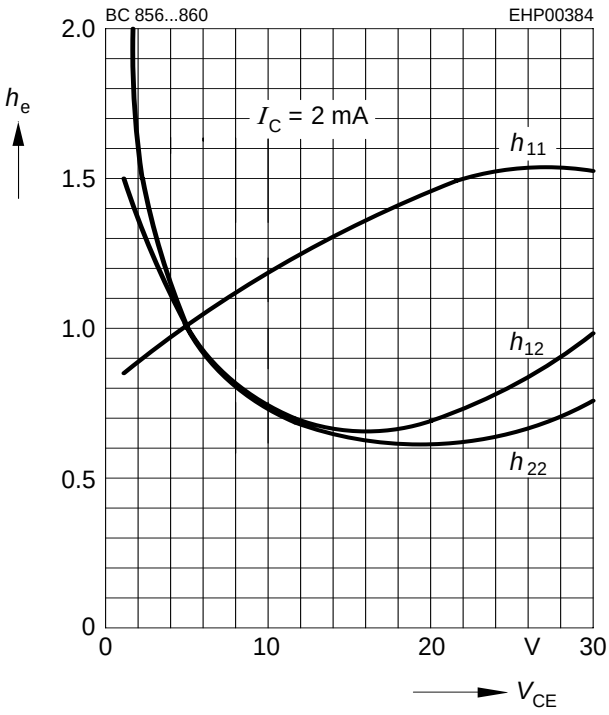
h parameter $h_e = f(I_C)$ normalized

V_{CE} = 5V



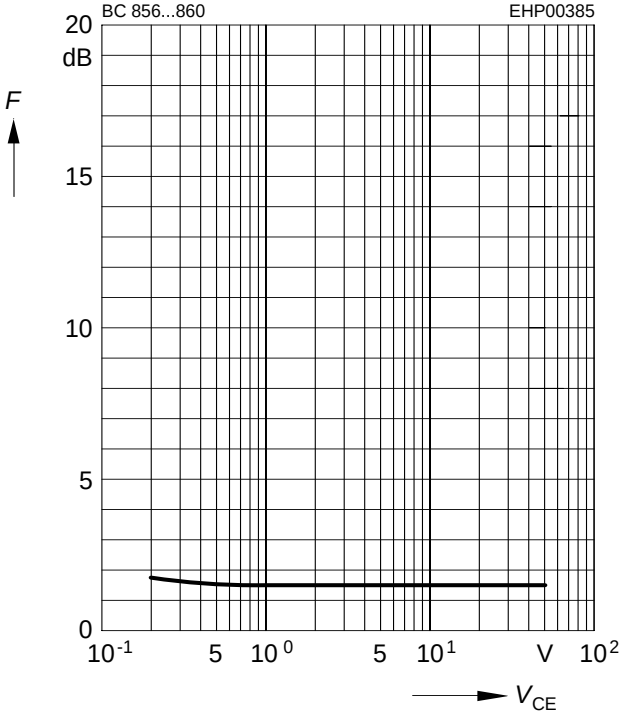
h parameter $h_e = f(V_{CE})$ normalized

I_C = 2mA



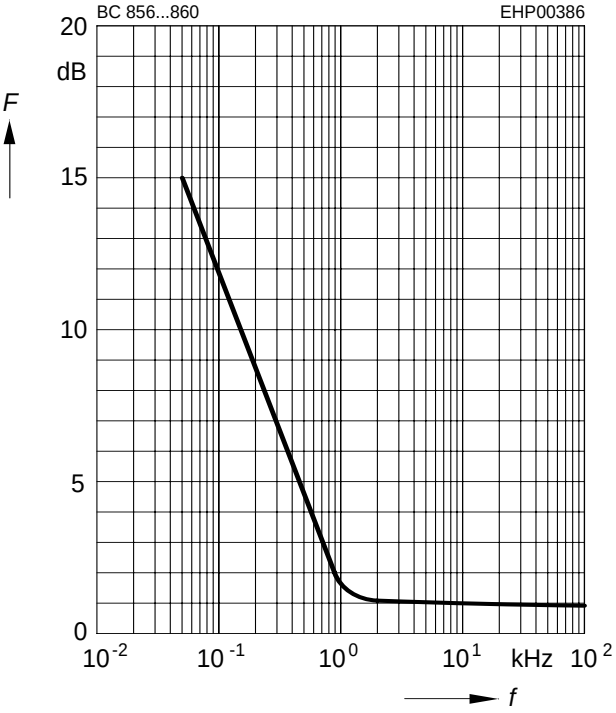
Noise figure $F = f(V_{CE})$

I_C = 0.2mA, R_S = 2kΩ, f = 1kHz

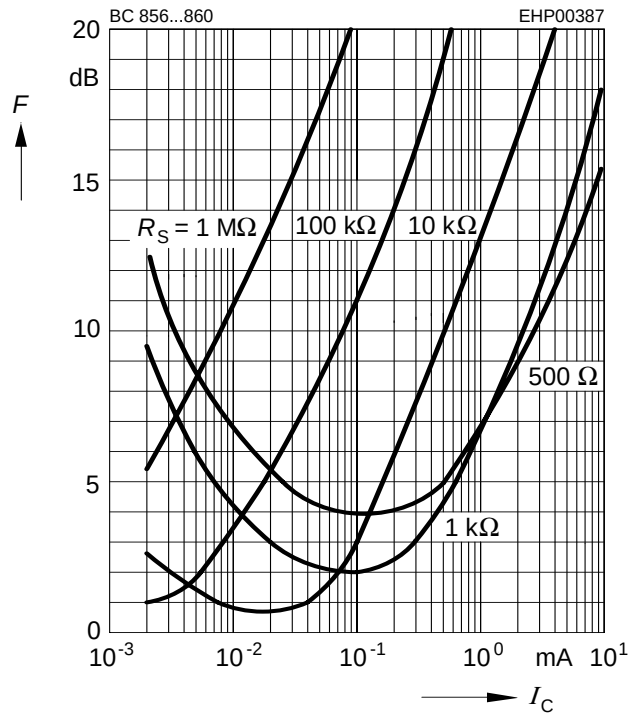


Noise figure $F = f(f)$

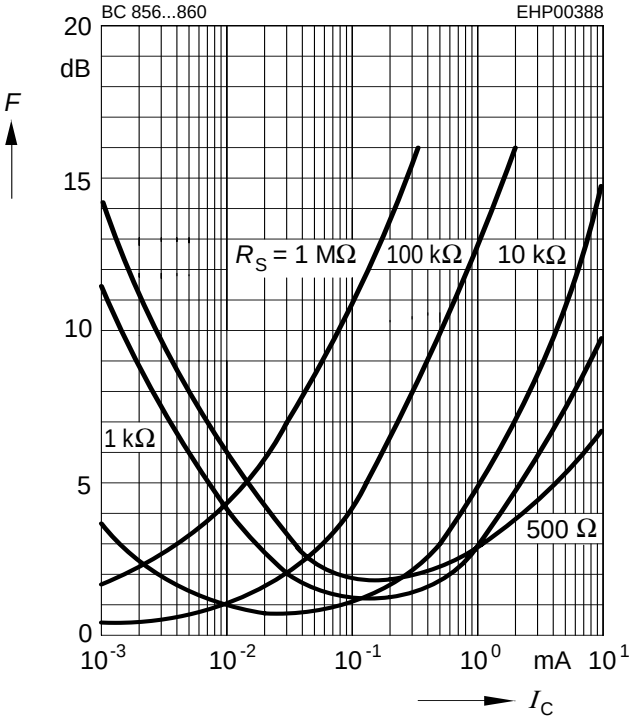
I_C = 0.2mA, V_{CE} = 5V, R_S = 2kΩ



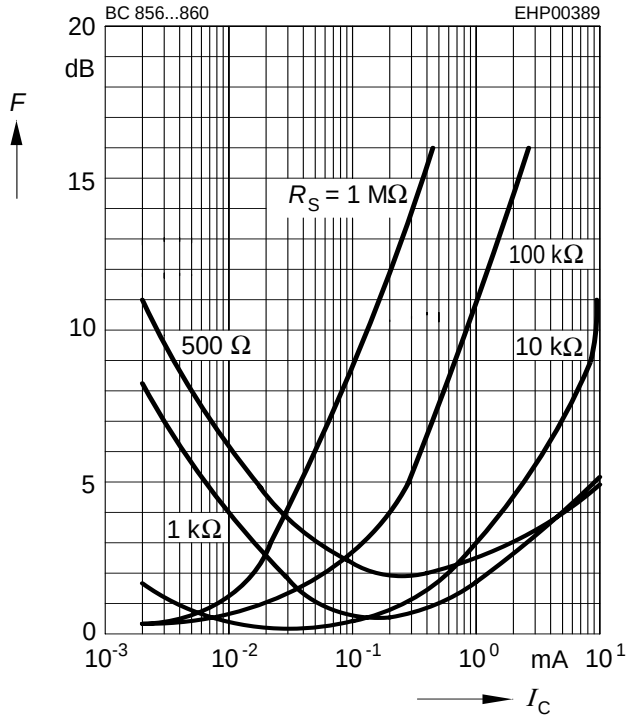
Noise figure $F = f(I_C)$
V_{CE} = 5V, f = 120Hz



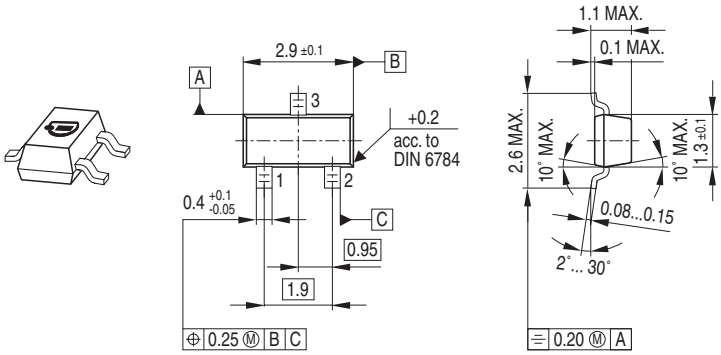
Noise figure $F = f(I_C)$
V_{CE} = 5V, f = 1kHz



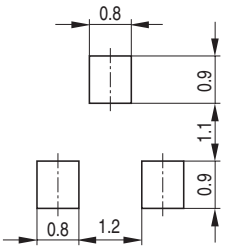
Noise figure $F = f(I_C)$
V_{CE} = 5V, f = 10kHz



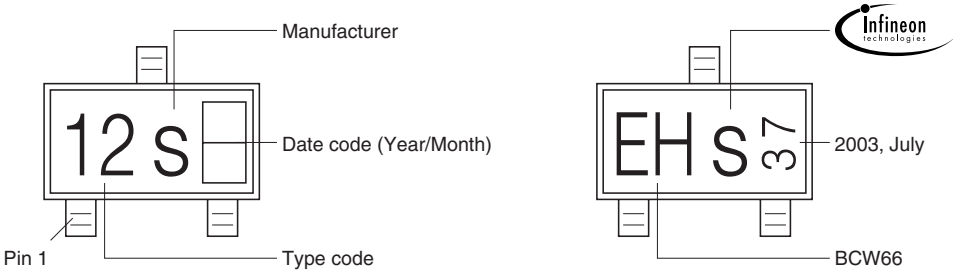
Package Outline



Foot Print



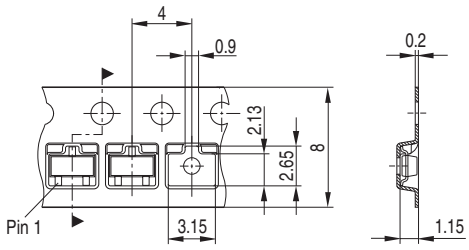
Marking Layout



Example

Packing

Code E6327: Reel ø180 mm = 3.000 Pieces/Reel
Code E6433: Reel ø330 mm = 10.000 Pieces/Reel



Published by Infineon Technologies AG,
St.-Martin-Strasse 53,
81669 München

Attention please!

The information herein is given to describe certain components and shall not be considered as a guarantee of characteristics.
Terms of delivery and rights to technical change reserved.
We hereby disclaim any and all warranties, including but not limited to warranties of non-infringement, regarding circuits, descriptions and charts stated herein.

Information

For further information on technology, delivery terms and conditions and prices please contact your nearest Infineon Technologies Office (www.Infineon.com).

Warnings

Due to technical requirements components may contain dangerous substances. For information on the types in question please contact your nearest Infineon Technologies Office.
Infineon Technologies Components may only be used in life-support devices or systems with the express written approval of Infineon Technologies, if a failure of such components can reasonably be expected to cause the failure of that life-support device or system, or to affect the safety or effectiveness of that device or system. Life support devices or systems are intended to be implanted in the human body, or to support and/or maintain and sustain and/or protect human life. If they fail, it is reasonable to assume that the health of the user or other persons may be endangered.