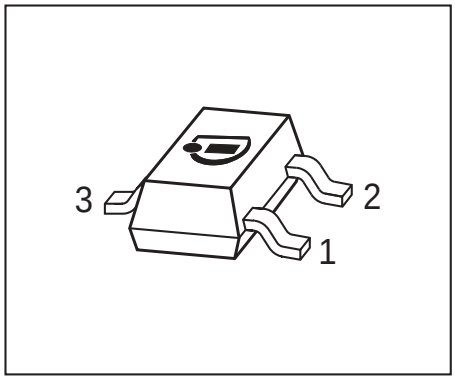
PNP Silicon AF Transistor



- 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: BC847, BC850
- Not for automotive applications*
- Pb-free (RoHS compliant) package[1)]

RoHS

Type	Marking	Pin Configuration			Package
BC857B	3Fs	1 = B	2 = E	3 = C	SOT23
BC857C	3Gs	1 = B	2 = E	3 = C	SOT23
BC860C	4Gs	1 = B	2 = E	3 = C	SOT23

* Automotive qualification ongoing

Maximum Ratings

Parameter	Symbol	Value	Unit
Collector-emitter voltage	V_{CEO}	45	V
Collector-emitter voltage	V_{CES}	50	
Collector-base voltage	V_{CBO}	50	
Emitter-base voltage	V_{EBO}	5	
Collector current	I_C	100	mA
Peak collector current	I_{CM}	200	
Peak base current	I_{BM}	200	
Peak emitter current	I_{EM}	200	mA
Total power dissipation- $T_S \leq 119$ °C	P_{tot}	330	mW
Junction temperature	T_j	150	°C
Storage temperature	T_{stg}	-65 ... 150	

[1]Pb-containing package may be available upon special request

Thermal Resistance

Parameter	Symbol	Value	Unit
Junction - soldering point[1)]	R_{thJS}	≤ 95	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 I_C = 10 mA, I_B = 0	$V_{(BR)CEO}$	45	-	-	V
Collector-base breakdown voltage I_C = 10 µA, I_E = 0	$V_{(BR)CBO}$	50	-	-	
Collector-emitter breakdown voltage I_C = 10 µA, V_{BE} = 0	$V_{(BR)CES}$	50	-	-	
Emitter-base breakdown voltage I_E = 1 µA, I_C = 0	$V_{(BR)EBO}$	5	-	-	
Collector-base cutoff current	I_{CBO}				µA
V_{CB} = 30 V, I_E = 0		-	-	0.015	
V_{CB} = 30 V, I_E = 0 , T_A = 150 °C		-	-	5	
DC current gain[2)]	h_{FE}				-
I_C = 10 µA, V_{CE} = 5 V, h_{FE}-group B		-	250	-	
I_C = 10 µA, V_{CE} = 5 V, h_{FE}-group C		-	480	-	
I_C = 2 mA, V_{CE} = 5 V, h_{FE}-group B		220	290	475	
I_C = 2 mA, V_{CE} = 5 V, h_{FE}-group C		420	520	800	
Collector-emitter saturation voltage[2)]	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[2)]	V_{BEsat}				
I_C = 10 mA, I_B = 0.5 mA		-	700	-	
I_C = 100 mA, I_B = 5 mA		-	850	-	
Base-emitter voltage[2)]	$V_{BE(ON)}$				
I_C = 2 mA, V_{CE} = 5 V		600	650	750	
I_C = 10 mA, V_{CE} = 5 V		-	-	820	

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

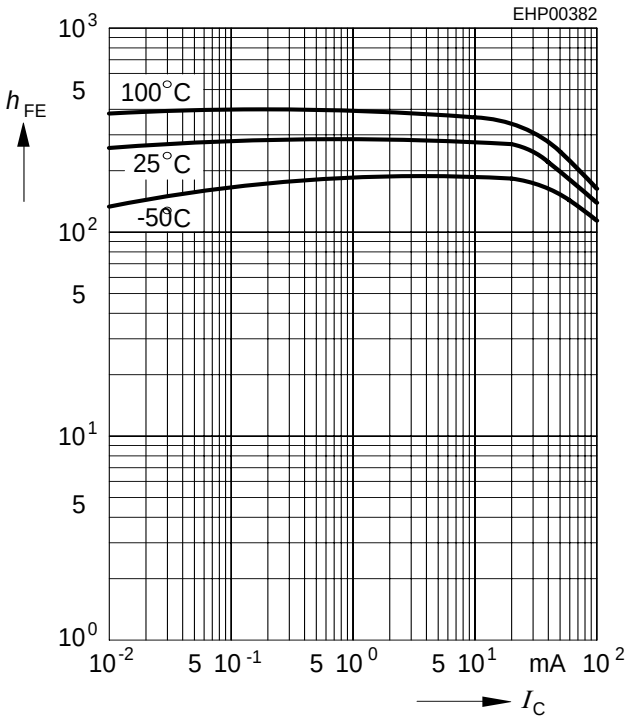
[2]Pulse test: t < 300µs; D < 2%

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}	-	2	-	pF
Emitter-base capacitance V_{EB} = 0.5 V, f = 1 MHz	C_{eb}	-	9	-	
Noise figure I_C = 0.2 mA, V_{CE} = 5 V, f = 1 kHz, Δf = 200 Hz, R_S = 2 kΩ, BC860	F	-	1	4	dB
Equivalent noise voltage I_C = 200 µA, V_{CE} = 5 V, R_S = 2 kΩ, f = 10 ... 50 Hz , BC860	V_n	-	-	0.11	µV

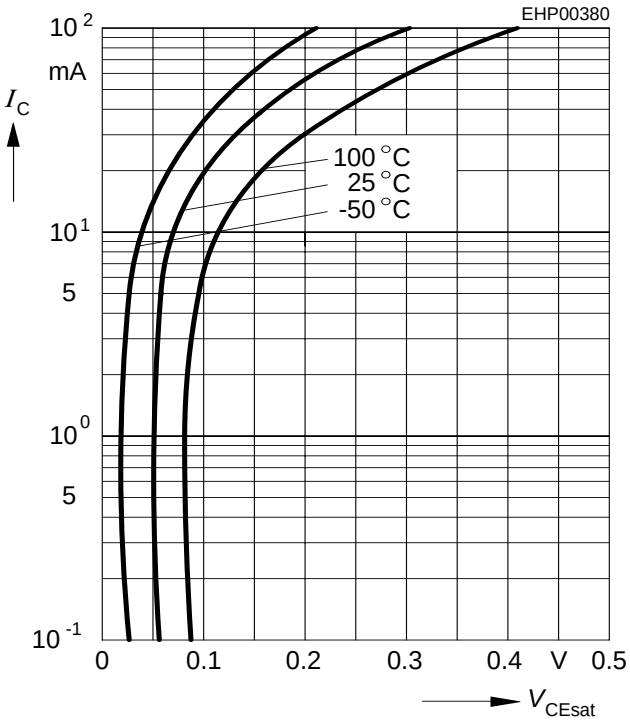
DC current gain $h_{FE} = f(I_C)$

V_{CE} = 5 V



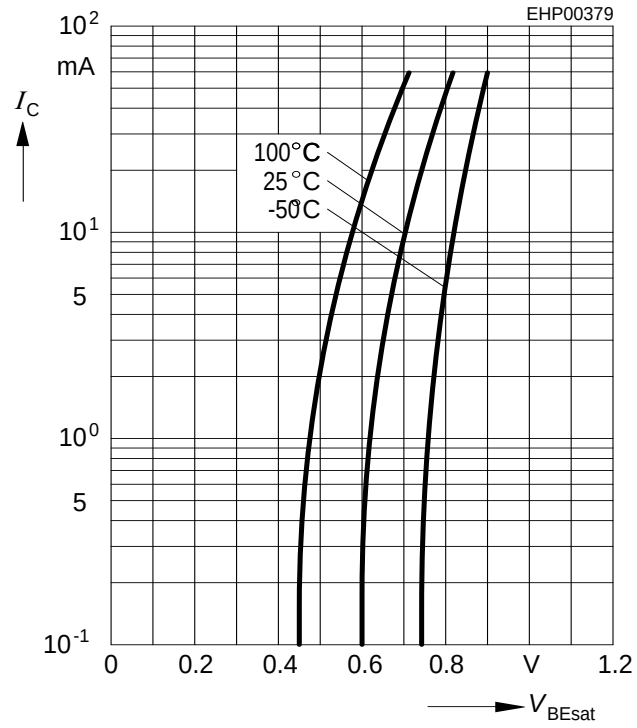
Collector-emitter saturation voltage

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



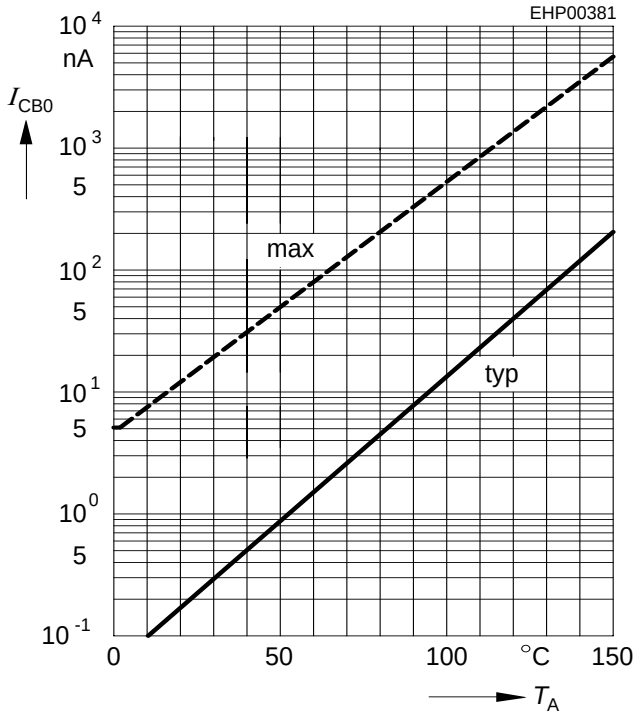
Base-emitter saturation voltage

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



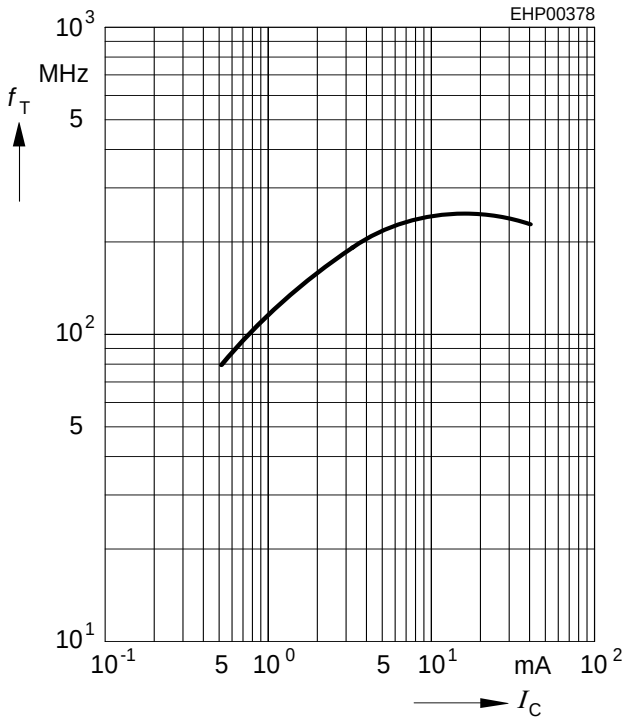
Collector cutoff current $I_{CBO} = f(T_A)$

V_{CBO} = 30 V



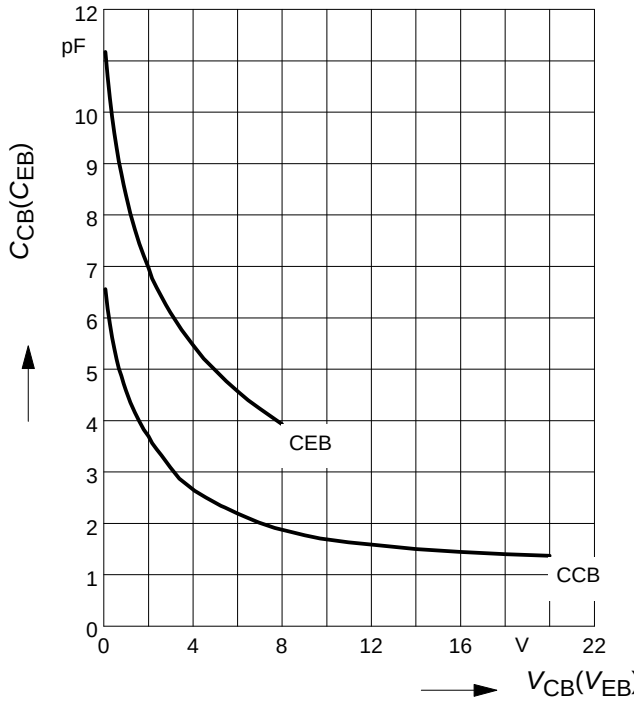
Transition frequency $f_T = f(I_C)$

V_{CE} = 5 V



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

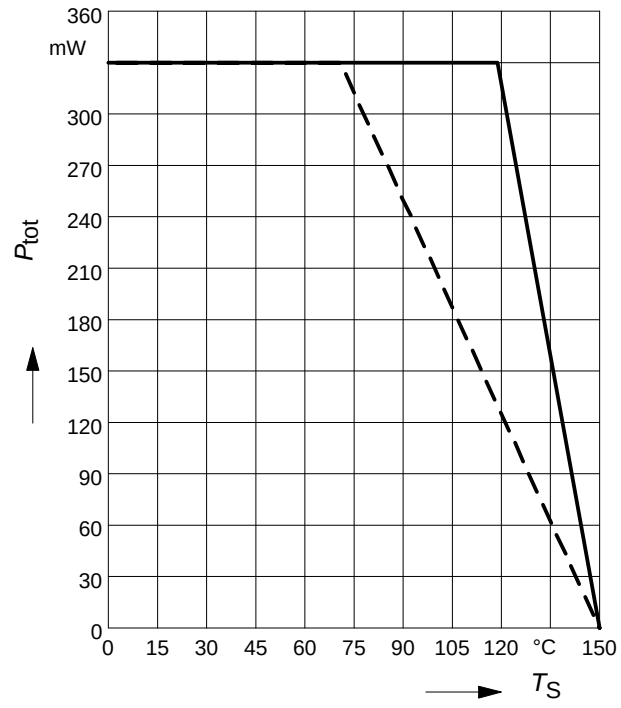
Emitter-base capacitance $C_{eb} = f(V_{EB})$



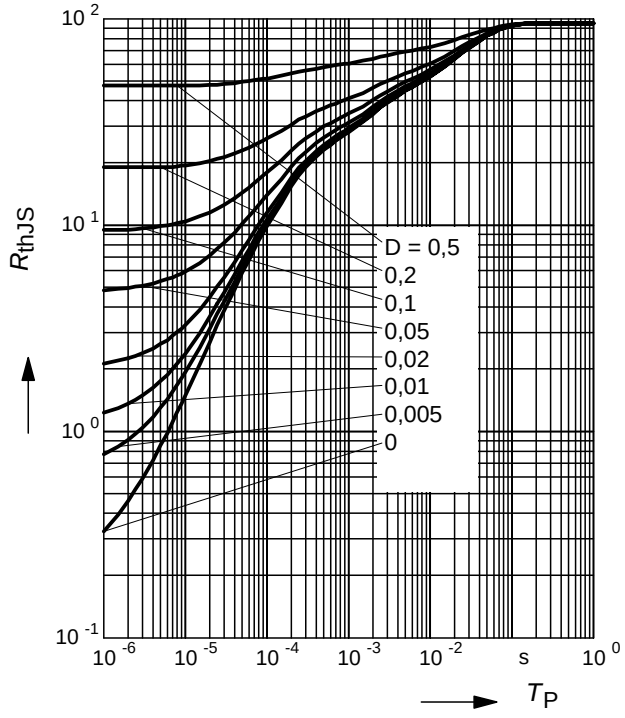
Total power dissipation $P_{tot} = f(T_S)$

— BC857...BC860B500x

⋯ BC857...BC860Exxx (e.g. E6327)

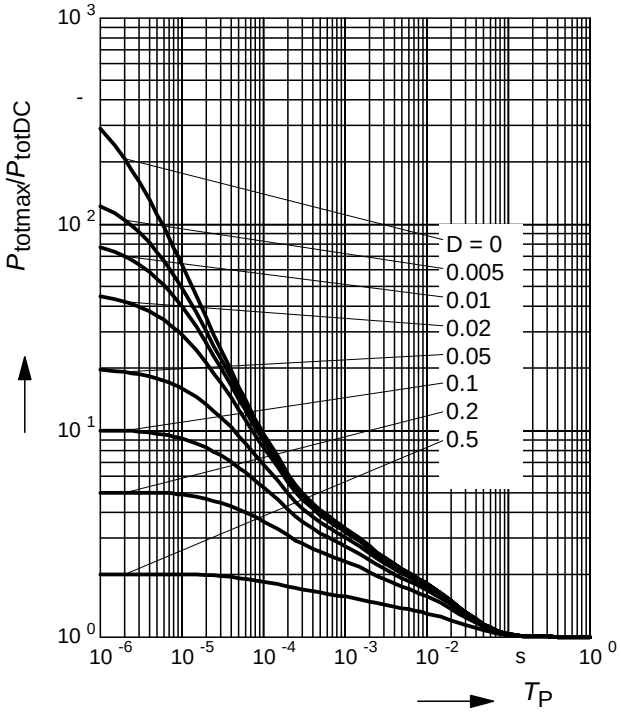


Permissible Pulse Load $R_{thJS} = f(t_p)$



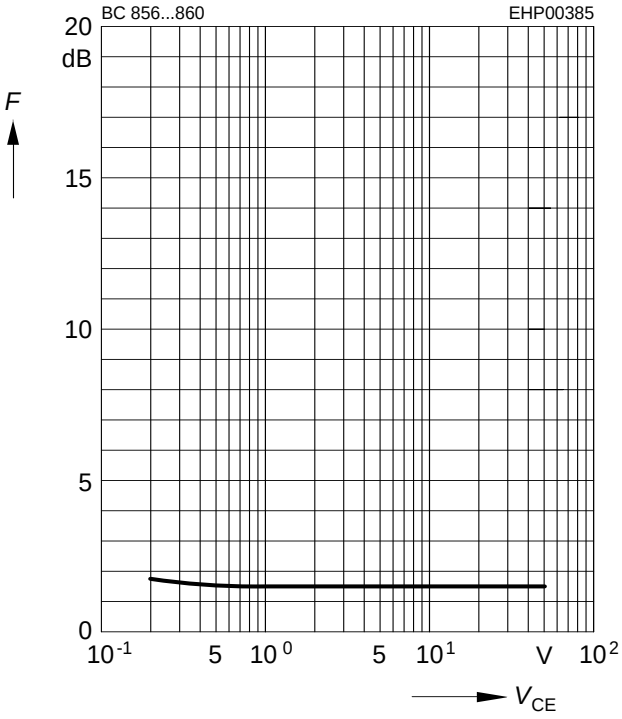
Permissible Pulse Load

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



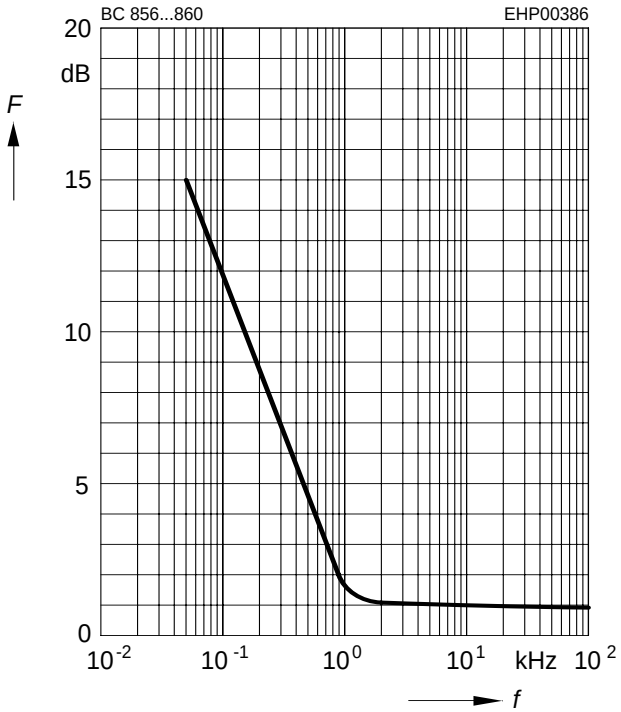
Noise figure $F = f(V_{CE})$

I_C = 0.2mA, R_S = 2kΩ , f = 1kHz



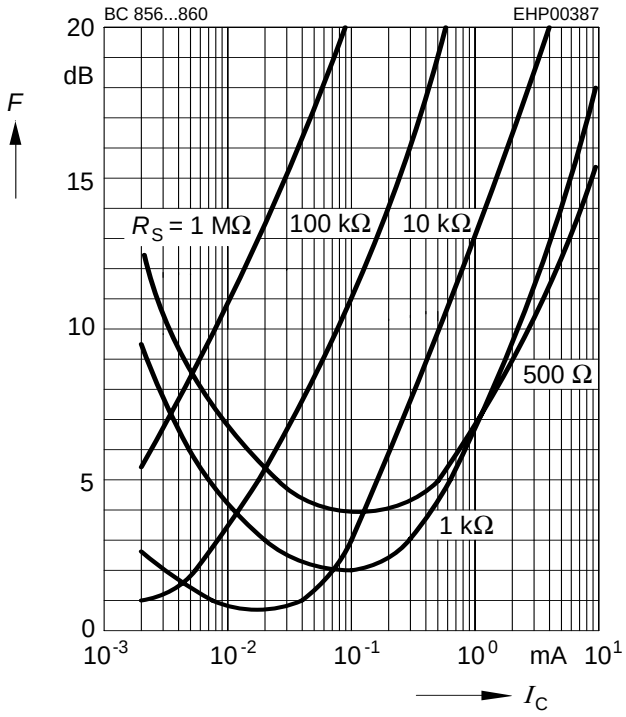
Noise figure $F = f(f)$

I_C = 0.2 mA, V_{CE} = 5 V, R_S = 2 kΩ



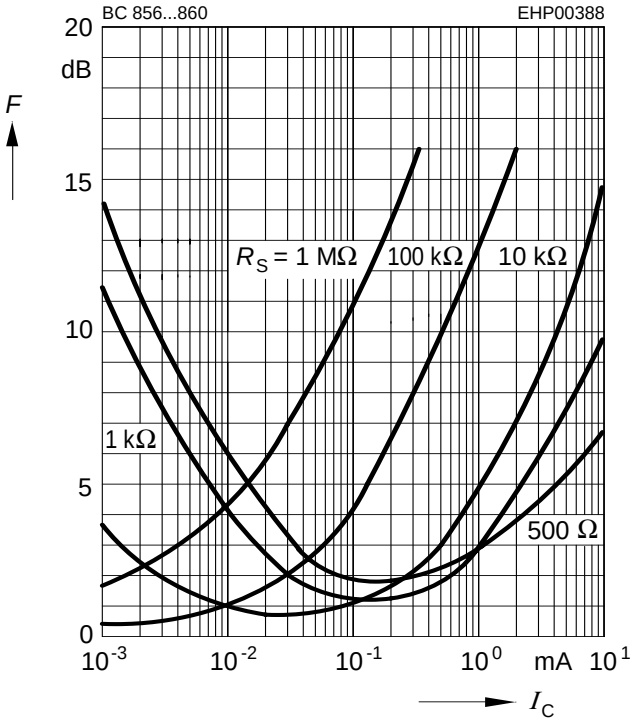
Noise figure $F = f(I_C)$

V_{CE} = 5V, f = 120Hz



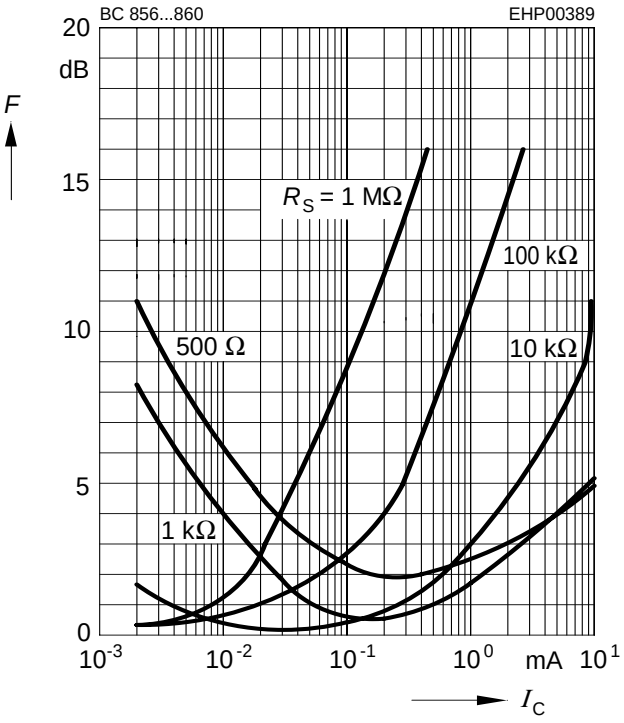
Noise figure $F = f(I_C)$

V_{CE} = 5V, f = 1kHz

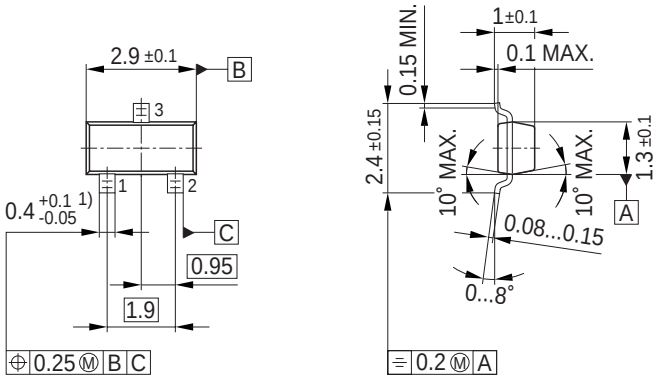


Noise figure $F = f(I_C)$

V_{CE} = 5V, f = 10kHz

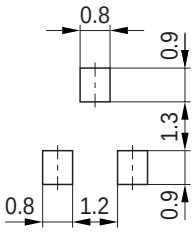


Package Outline

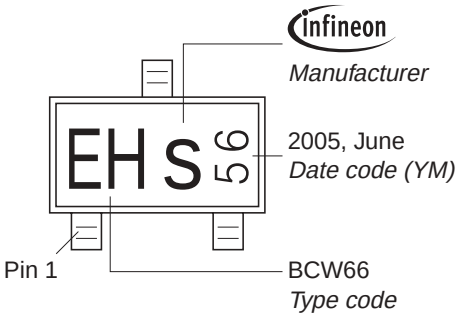


1) Lead width can be 0.6 max. in dambar area

Foot Print

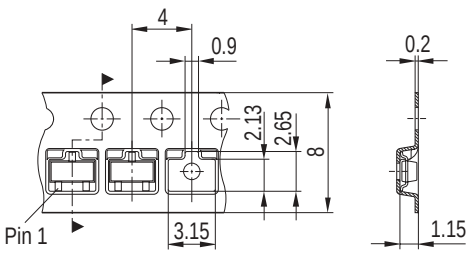


Marking Layout (Example)



Standard Packing

Reel ø180 mm = 3.000 Pieces/Reel
Reel ø330 mm = 10.000 Pieces/Reel



Edition 2006-02-01
Published by
Infineon Technologies AG
81726 München, Germany

Attention please!

The information given in this dokument shall in no event be regarded as a guarantee of conditions or characteristics (“Beschaffenheitsgarantie”). With respect to any examples or hints given herein, any typical values stated herein and/or any information regarding the application of the device, Infineon Technologies hereby disclaims any and all warranties and liabilities of any kind, including without limitation warranties of non-infringement of intellectual property rights of any third party.

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.