Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

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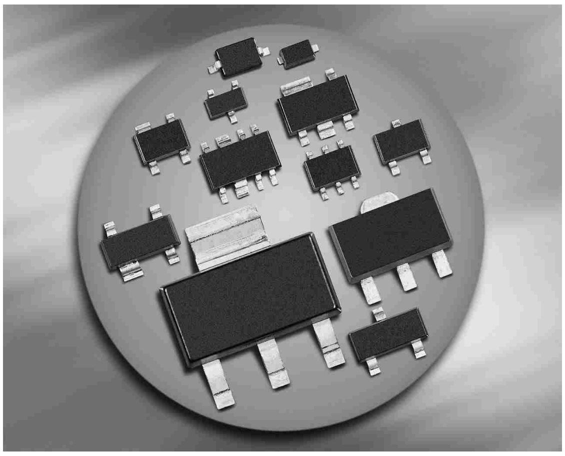
**NPN Silicon AF Transistors**

- 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:
  BC857...-BC860...(PNP)
- Pb-free (RoHS compliant) package
- Qualified according AEC Q101[1)]



AEC Qualified  RoHS

[1]BC847BL3 is not qualified according AEC Q101

| Type | Marking | Pin Configuration | | | | | | Package |
|---|---|---|---|---|---|---|---|---|
| BC847A | 1Es | 1=B | 2=E | 3=C | - | - | - | SOT23 |
| BC847B | 1Fs | 1=B | 2=E | 3=C | - | - | - | SOT23 |
| BC847BL3* | 1F | 1=B | 2=E | 3=C | - | - | - | TSLP-3-1 |
| BC847BW | 1Fs | 1=B | 2=E | 3=C | - | - | - | SOT323 |
| BC847C | 1Gs | 1=B | 2=E | 3=C | - | - | - | SOT23 |
| BC847CW | 1Gs | 1=B | 2=E | 3=C | - | - | - | SOT323 |
| BC848A | 1Js | 1=B | 2=E | 3=C | - | - | - | SOT23 |
| BC848B | 1Ks | 1=B | 2=E | 3=C | - | - | - | SOT23 |
| BC848BL3 | 1K | 1=B | 2=E | 3=C | - | - | - | TSLP-3-1 |
| BC848BW | 1Ks | 1=B | 2=E | 3=C | - | - | - | SOT323 |
| BC848C | 1Ls | 1=B | 2=E | 3=C | - | - | - | SOT23 |
| BC848CW | 1Ls | 1=B | 2=E | 3=C | - | - | - | SOT323 |
| BC849B | 2Bs | 1=B | 2=E | 3=C | - | - | - | SOT23 |
| BC849C | 2Cs | 1=B | 2=E | 3=C | - | - | - | SOT23 |
| BC849CW | 2Cs | 1=B | 2=E | 3=C | - | - | - | SOT323 |
| BC850B | 2Fs | 1=B | 2=E | 3=C | - | - | - | SOT23 |
| BC850BW | 2Fs | 1=B | 2=E | 3=C | - | - | - | SOT323 |
| BC850C | 2Gs | 1=B | 2=E | 3=C | - | - | - | SOT23 |
| BC850CW | 2Gs | 1=B | 2=E | 3=C | - | - | - | SOT323 |

* Not qualified according AEC Q101

**Maximum Ratings**

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Collector-emitter voltage<br>BC847..., BC850...<br>BC848..., BC849... | $V_{CEO}$ | <br>45<br>30 | V |
| Collector-emitter voltage<br>BC847..., BC850...<br>BC848..., BC849... | $V_{CES}$ | <br>50<br>30 | |
| Collector-base voltage<br>BC847..., BC850...<br>BC848..., BC849... | $V_{CBO}$ | <br>50<br>30 | |
| Emitter-base voltage<br>BC847..., BC850...<br>BC848..., BC849... | $V_{EBO}$ | <br>6<br>6 | |
| Collector current | $I_C$ | 100 | mA |
| Peak collector current, $t_p \leq 10$ ms | $I_{CM}$ | 200 | |
| Total power dissipation-<br>$T_S \leq 71$ °C, BC847-BC850<br>$T_S \leq 135$ °C, BC847BL3-BC848BL3<br>$T_S \leq 124$ °C, BC847W-BC850W | $P_{tot}$ | <br>330<br>250<br>250 | mW |
| Junction temperature | $T_j$ | 150 | °C |
| Storage temperature | $T_{stg}$ | -65 ... 150 | |

**Thermal Resistance**

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Junction - soldering point[1)]<br>BC847-BC850<br>BC847BL3-BC848BL3<br>BC847W-BC850W | $R_{thJS}$ | <br>≤ 240<br>≤ 60<br>≤ 105 | K/W |

[1]For calculation of $R_{thJA}$ please refer to Application Note AN077 (Thermal Resistance Calculation)

**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 , BC847..., BC850... | | 45 | - | - | |
| $I_C$ = 10 mA, $I_B$ = 0 , BC848..., BC849... | | 30 | - | - | |
| Collector-base breakdown voltage | $V_{(BR)CBO}$ | | | | |
| $I_C$ = 10 µA, $I_E$ = 0 , BC847..., BC850... | | 50 | - | - | |
| $I_C$ = 10 µA, $I_E$ = 0 , BC848..., BC849... | | 30 | - | - | |
| Emitter-base breakdown voltage | $V_{(BR)EBO}$ | - | 6 | - | |
| $I_E$ = 0 , $I_C$ = 10 µA | | | | | |
| Collector-base cutoff current | $I_{CBO}$ | | | | µA |
| $V_{CB}$ = 45 V, $I_E$ = 0 | | - | 0.015 | - | |
| $V_{CB}$ = 30 V, $I_E$ = 0 , $T_A$ = 150 °C | | - | 5 | - | |
| DC current gain[1)] | $h_{FE}$ | | | | - |
| $I_C$ = 10 µA, $V_{CE}$ = 5 V, $h_{FE}$-grp.A | | - | 140 | - | |
| $I_C$ = 10 µA, $V_{CE}$ = 5 V, $h_{FE}$-grp.B | | - | 250 | - | |
| $I_C$ = 10 µA, $V_{CE}$ = 5 V, $h_{FE}$-grp.C | | - | 480 | - | |
| $I_C$ = 2 mA, $V_{CE}$ = 5 V, $h_{FE}$-grp.A | | 110 | 180 | 220 | |
| $I_C$ = 2 mA, $V_{CE}$ = 5 V, $h_{FE}$-grp.B | | 200 | 290 | 450 | |
| $I_C$ = 2 mA, $V_{CE}$ = 5 V, $h_{FE}$-grp.C | | 420 | 520 | 800 | |
| Collector-emitter saturation voltage[1)] | $V_{CEsat}$ | | | | mV |
| $I_C$ = 10 mA, $I_B$ = 0.5 mA | | - | 90 | 250 | |
| $I_C$ = 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 | |

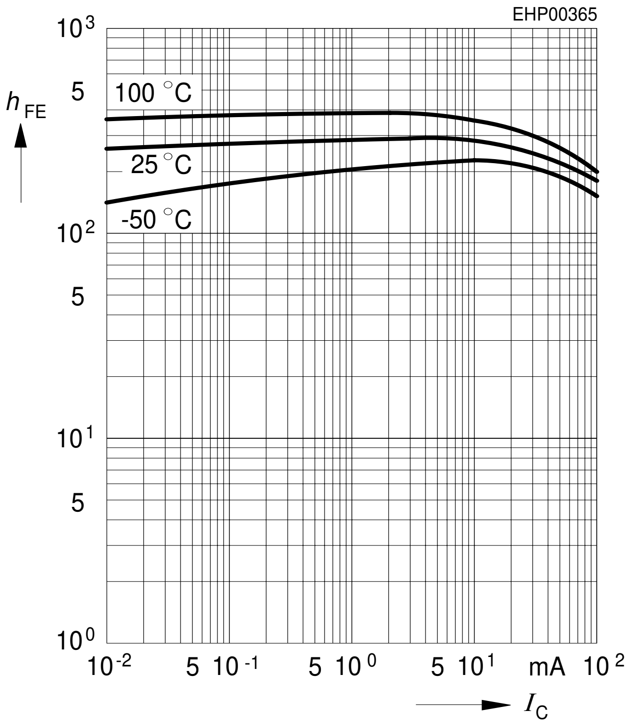
[1]Pulse test: t < 300µs; D < 2%

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

| Parameter | Symbol | Values | | | Unit |
|---|---|---|---|---|---|
| | | min. | typ. | max. | |
| **AC Characteristics** | | | | | |
| Transition frequency<br>$I_C$ = 10 mA, $V_{CE}$ = 5 V, $f$ = 100 MHz | $f_T$ | - | 250 | - | MHz |
| Collector-base capacitance<br>$V_{CB}$ = 10 V, $f$ = 1 MHz | $C_{cb}$ | - | 0.95 | - | pF |
| Emitter-base capacitance<br>$V_{EB}$ = 0.5 V, $f$ = 1 MHz | $C_{eb}$ | - | 9 | - | |
| Short-circuit input impedance | $h_{11e}$ | | | | kΩ |
| $I_C$ = 2 mA, $V_{CE}$ = 5 V, $f$ = 1 kHz, $h_{FE}$-grp.A | | - | 2.7 | - | |
| $I_C$ = 2 mA, $V_{CE}$ = 5 V, $f$ = 1 kHz, $h_{FE}$-grp.B | | - | 4.5 | - | |
| $I_C$ = 2 mA, $V_{CE}$ = 5 V, $f$ = 1 kHz, $h_{FE}$-grp.C | | - | 8.7 | - | |
| Open-circuit reverse voltage transf. ratio | $h_{12e}$ | | | | $10^{-4}$ |
| $I_C$ = 2 mA, $V_{CE}$ = 5 V, $f$ = 1 kHz, $h_{FE}$-grp.A | | - | 1.5 | - | |
| $I_C$ = 2 mA, $V_{CE}$ = 5 V, $f$ = 1 kHz, $h_{FE}$-grp.B | | - | 2 | - | |
| $I_C$ = 2 mA, $V_{CE}$ = 5 V, $f$ = 1 kHz, $h_{FE}$-grp.C | | - | 3 | - | |
| Short-circuit forward current transf. ratio | $h_{21e}$ | | | | |
| $I_C$ = 2 mA, $V_{CE}$ = 5 V, $f$ = 1 kHz, $h_{FE}$-grp.A | | - | 200 | - | |
| $I_C$ = 2 mA, $V_{CE}$ = 5 V, $f$ = 1 kHz, $h_{FE}$-grp.B | | - | 330 | - | |
| $I_C$ = 2 mA, $V_{CE}$ = 5 V, $f$ = 1 kHz, $h_{FE}$-grp.C | | - | 600 | - | |
| Open-circuit output admittance | $h_{22e}$ | | | | µS |
| $I_C$ = 2 mA, $V_{CE}$ = 5 V, $f$ = 1 kHz, $h_{FE}$-grp.A | | - | 18 | - | |
| $I_C$ = 2 mA, $V_{CE}$ = 5 V, $f$ = 1 kHz, $h_{FE}$-grp.B | | - | 30 | - | |
| $I_C$ = 2 mA, $V_{CE}$ = 5 V, $f$ = 1 kHz, $h_{FE}$-grp.C | | - | 60 | - | |
| Noise figure<br>$I_C$ = 200 µA, $V_{CE}$ = 5 V, $f$ = 1 kHz,<br>$\Delta f$ = 200 Hz, $R_S$ = 2 kΩ, BC849..., BC850... | $F$ | - | 1.2 | 4 | dB |
| Equivalent noise voltage<br>$I_C$ = 200 µA, $V_{CE}$ = 5 V, $R_S$ = 2 kΩ,<br>$f$ = 10 ... 50 Hz , BC850... | $V_n$ | - | - | 0.135 | µV |

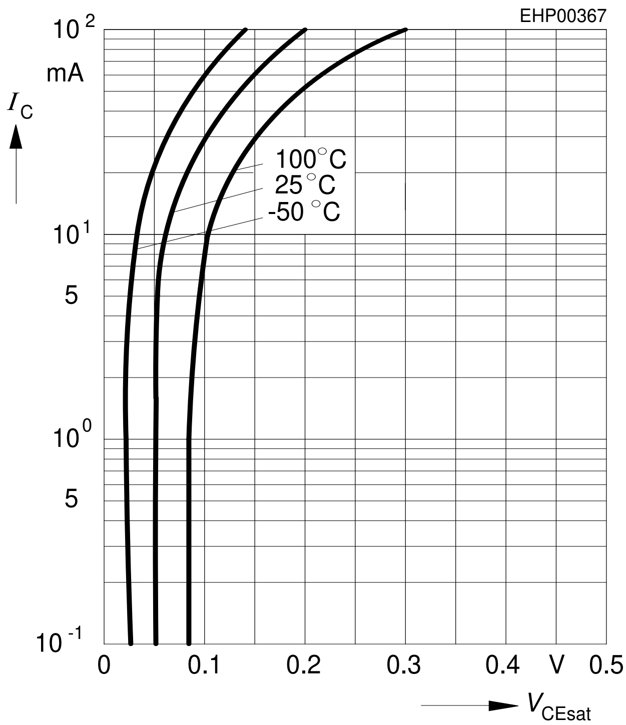
**DC current gain** $h_{FE} = f(I_C)$

$V_{CE}$ = 5 V



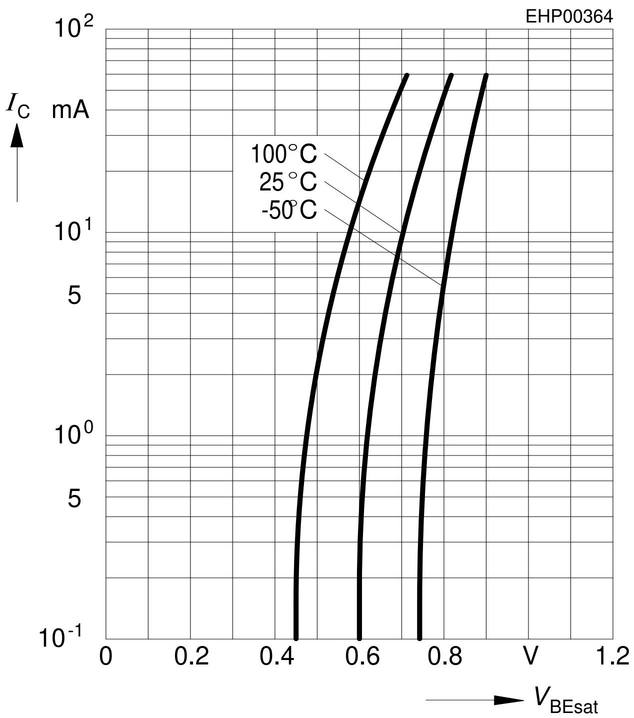

**Collector-emitter saturation voltage**

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



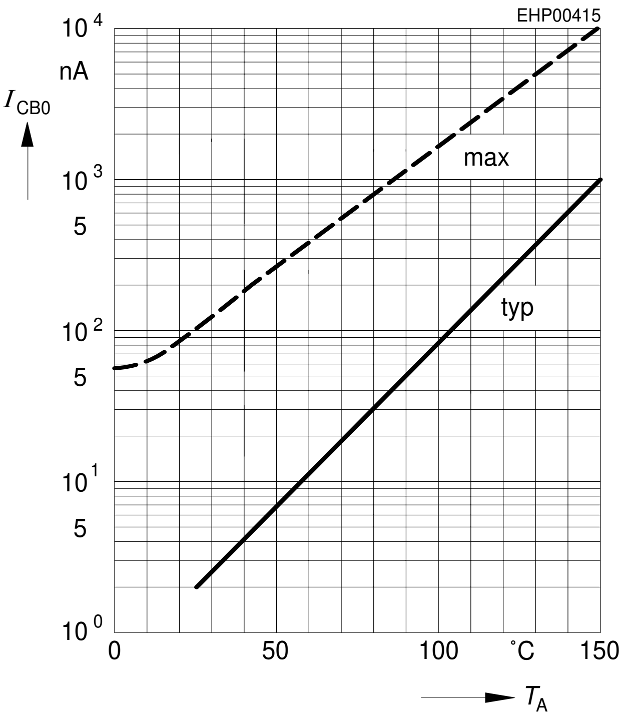

**Base-emitter saturation voltage**

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



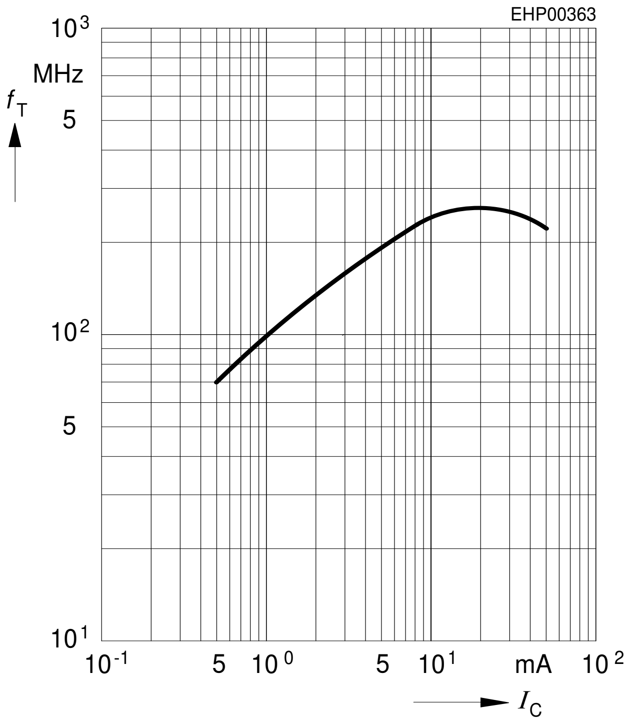

**Collector cutoff current** $I_{CBO} = f(T_A)$

$V_{CB}$ = 30 V



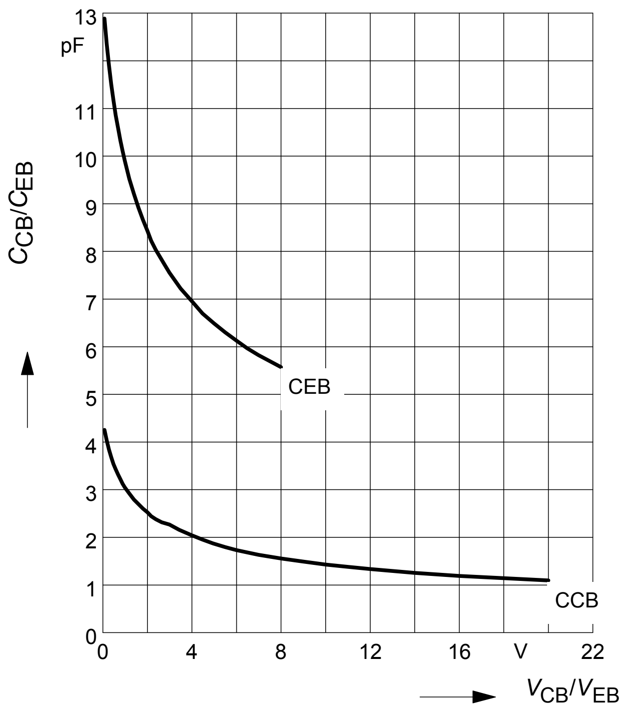
**Transition frequency** $f_T = f(I_C)$

$V_{CE} = 5$ V



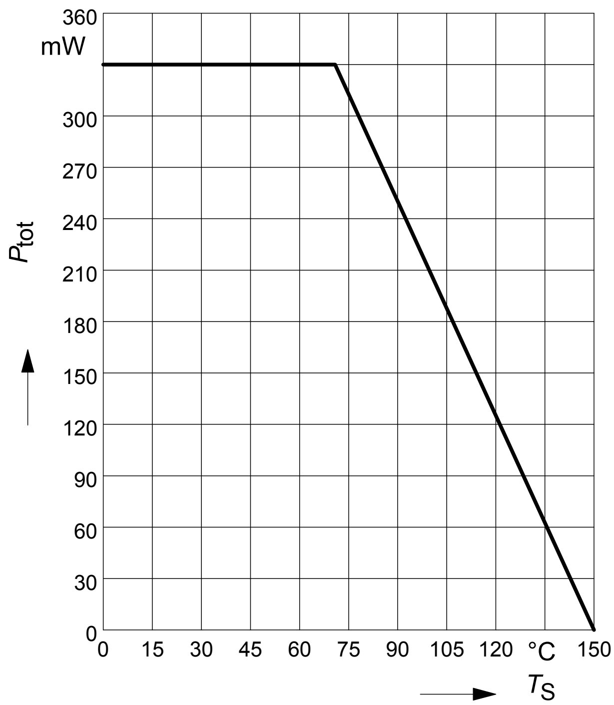

**Collector-base capacitance** $C_{cb} = f(V_{CB})$

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



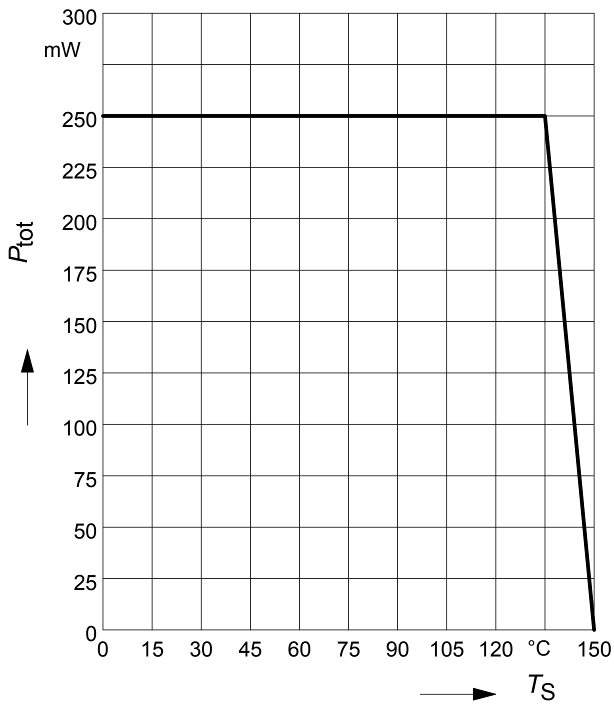

**Total power dissipation** $P_{tot} = f(T_S)$

BC847-BC850



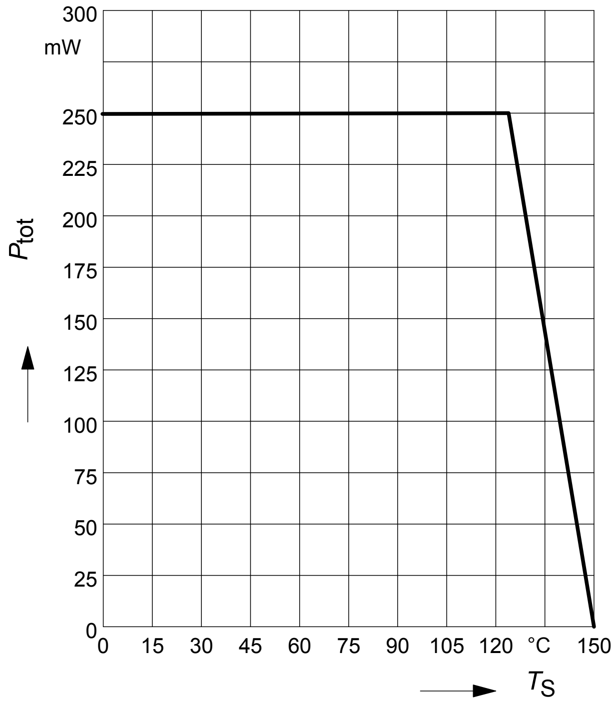

**Total power dissipation** $P_{tot} = f(T_S)$

BC847BL3/BC848BL3



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

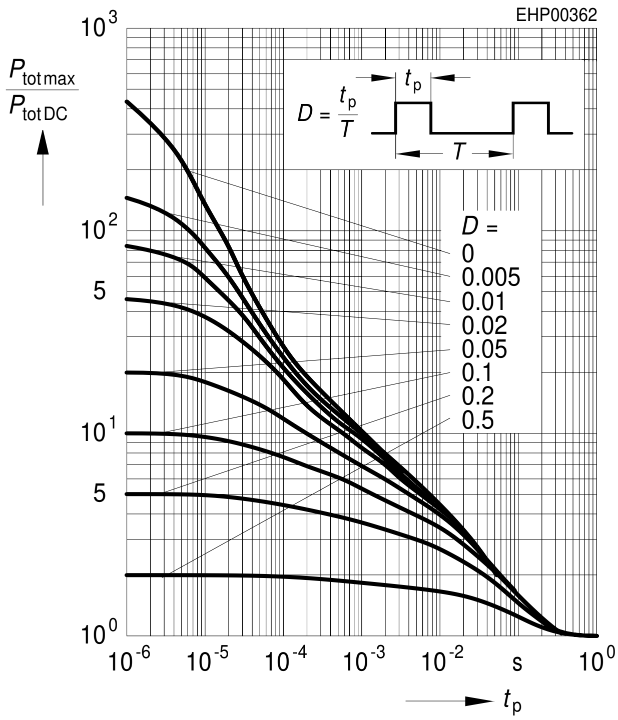
BC847W-BC850W




**Permissible Pulse Load**

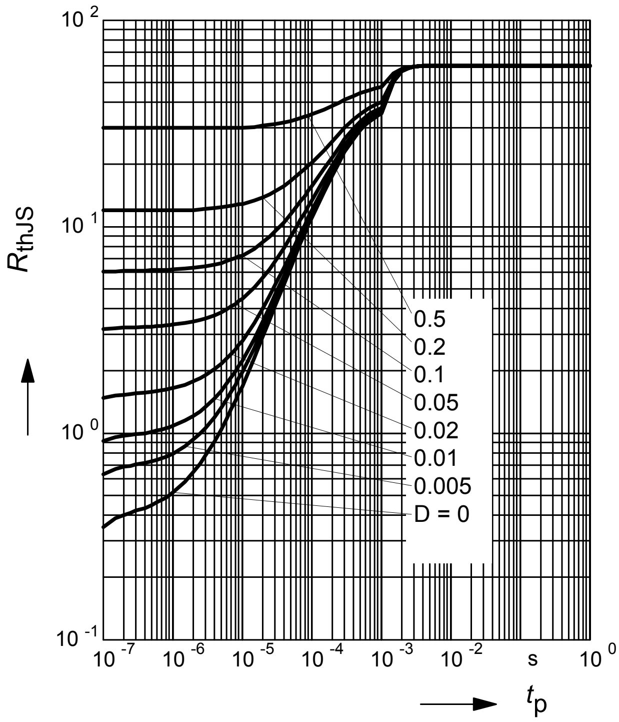
$P_{totmax}/P_{totDC} = f(t_p)$

BC847/W-BC850/W




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

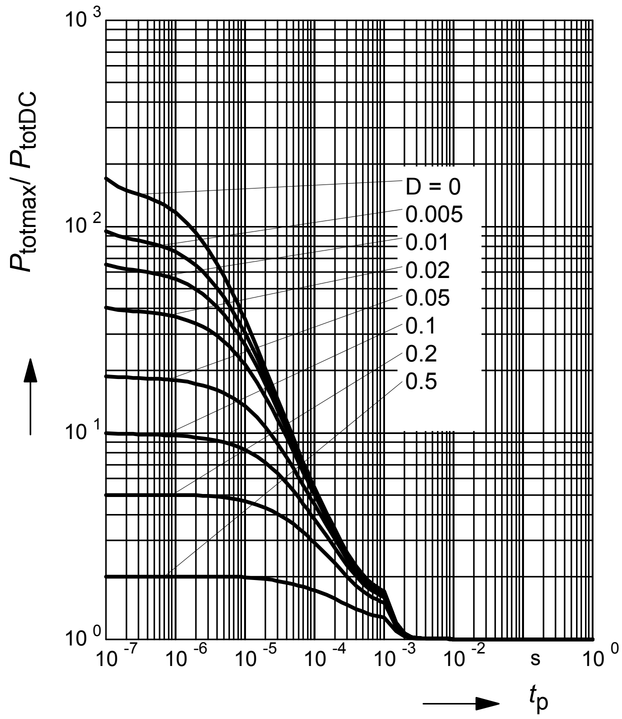
BC847BL3, BC848BL3




**Permissible Pulse Load**

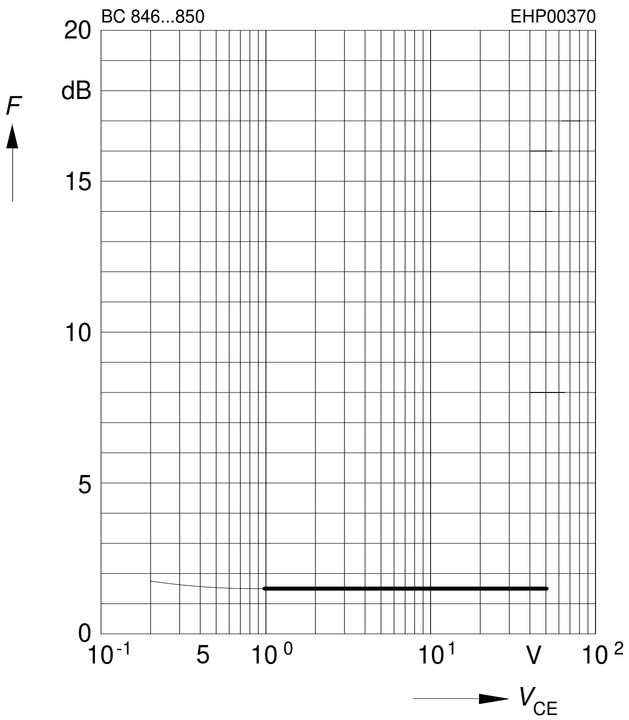
$P_{totmax}/P_{totDC} = f(t_p)$

BC847BL3, BC848BL3



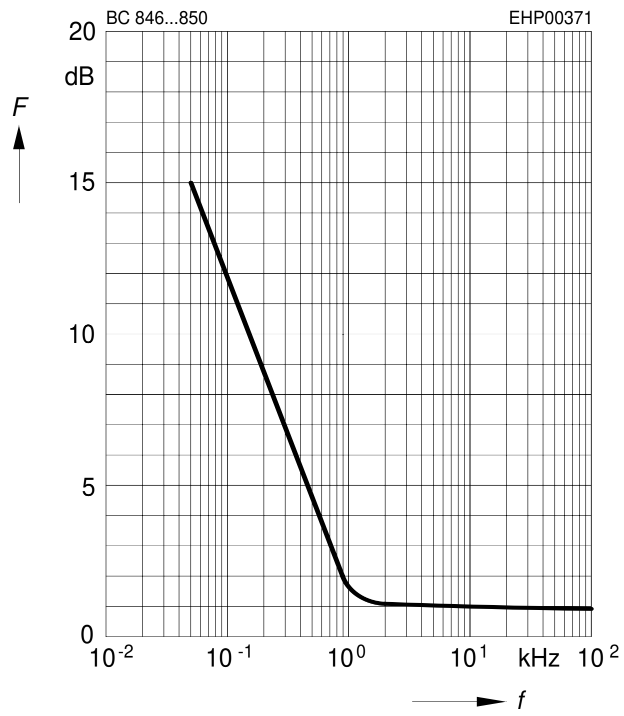
**Noise figure** $F = f(V_{CE})$

$I_C$ = 0.2mA, $R_S$ = 2kΩ , $f$ = 1kHz



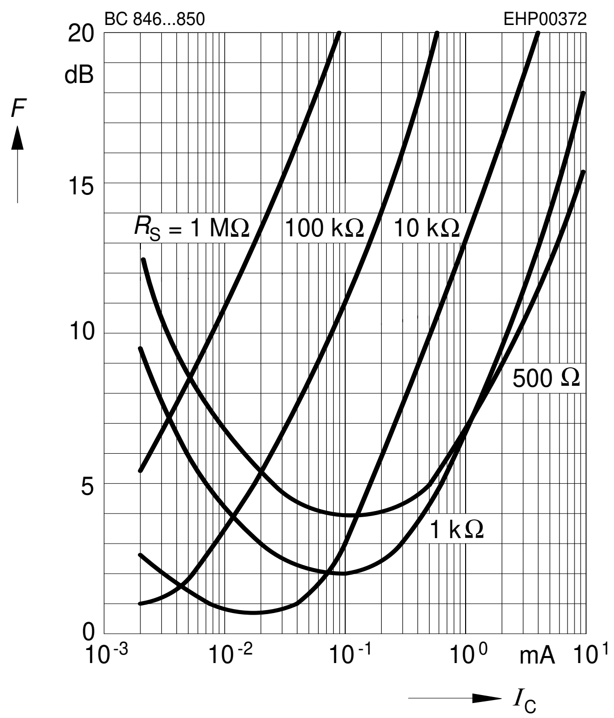

**Noise figure** $F = f(f)$

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



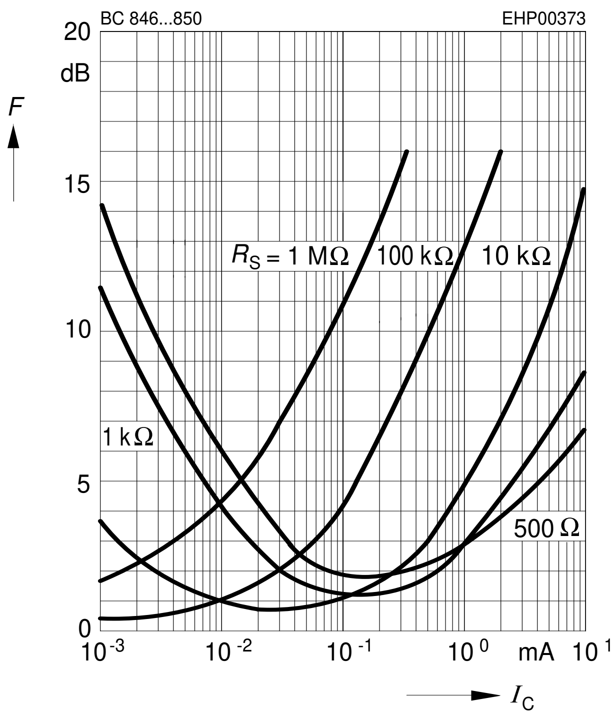

**Noise figure** $F = f(I_C)$

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



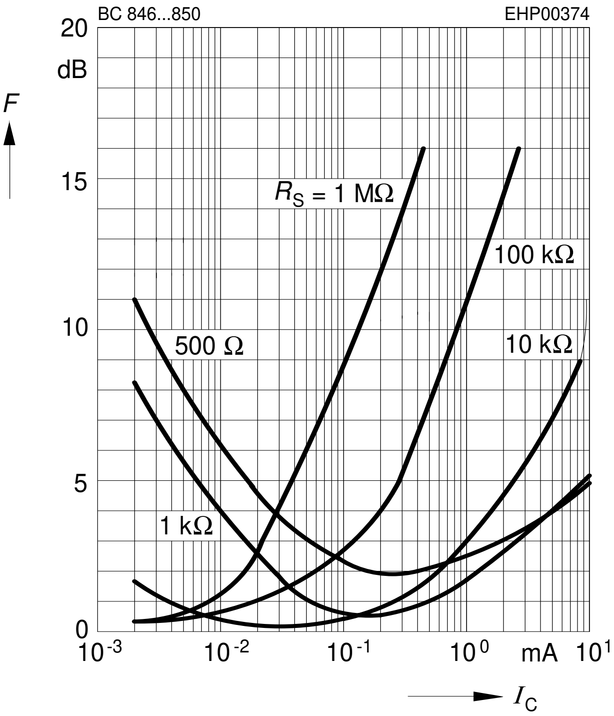

**Noise figure** $F = f(I_C)$

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

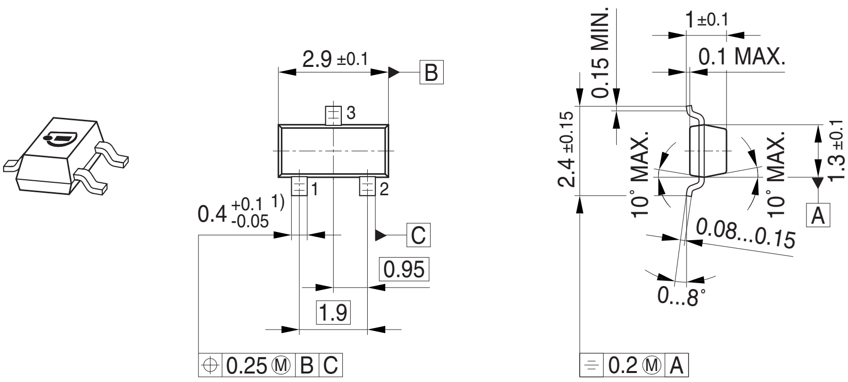


**Noise figure** $F = f(I_C)$

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

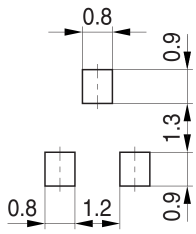


## Package Outline

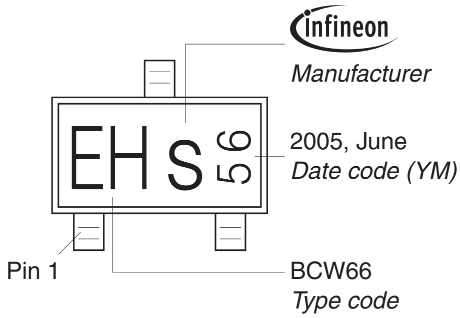



1) Lead width can be 0.6 max. in dambar area

## Foot Print

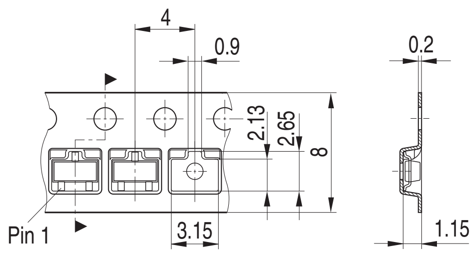



## Marking Layout (Example)

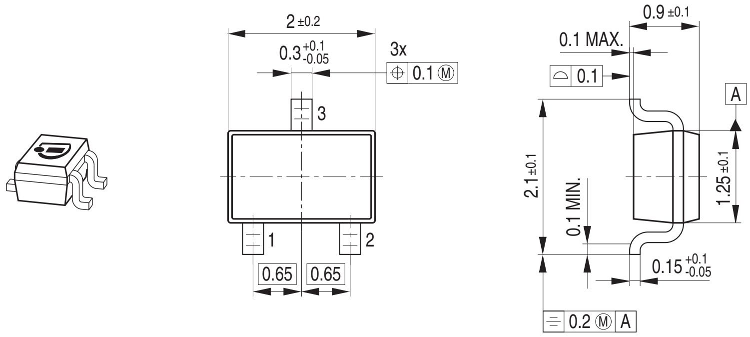



## Standard Packing

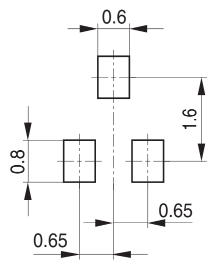
Reel ø180 mm = 3.000 Pieces/Reel
Reel ø330 mm = 10.000 Pieces/Reel



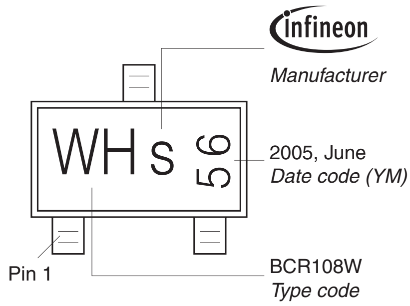
## Package Outline




## Foot Print

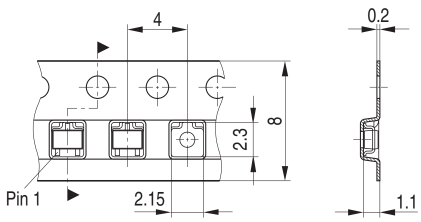



## Marking Layout (Example)

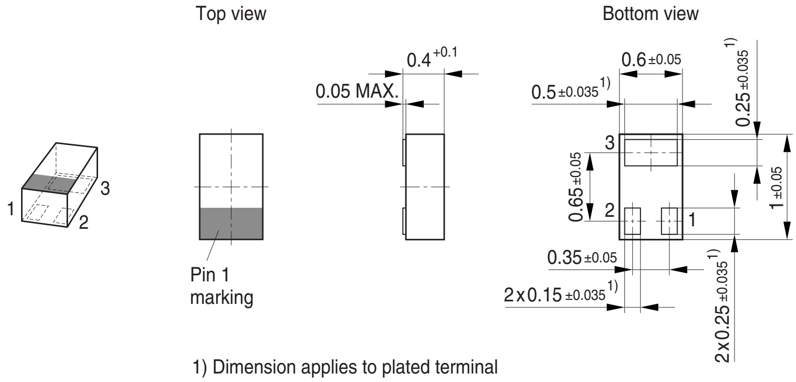



## Standard Packing

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



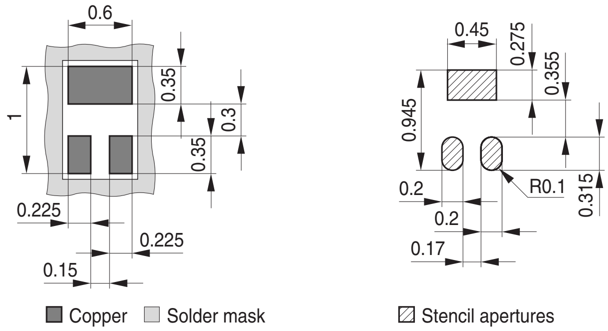
## Package Outline



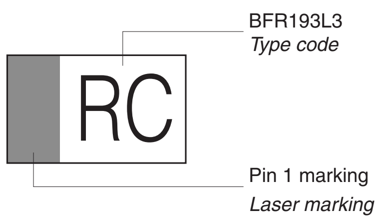

1) Dimension applies to plated terminal

## Foot Print

For board assembly information please refer to Infineon website "Packages"

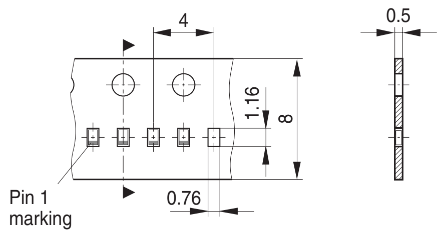



## Marking Layout (Example)




## Standard Packing

Reel ø180 mm = 15.000 Pieces/Reel



**Edition 2009-11-16**

**Published by**
**Infineon Technologies AG**
**81726 Munich, Germany**



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