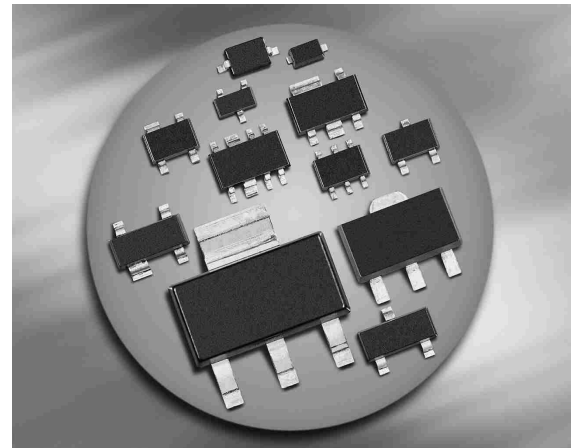
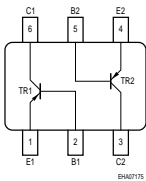


PNP Silicon AF Transistor Arrays

- For AF input stages and driver applications
- High current gain
- Low collector-emitter saturation voltage
- Two (galvanic) internal isolated transistor with good matching in one package
- BC856S / U, BC857S: For orientation in reel see package information below
- Pb-free (RoHS compliant) package ¹⁾
- Qualified according AEC Q101


**BC856S/U
BC857S**


| Type | Marking | Pin Configuration | | | | | | Package |
|--------|---------|-------------------|------|------|------|------|------|---------|
| | | 1=E1 | 2=B1 | 3=C2 | 4=E2 | 5=B2 | 6=C1 | |
| BC856S | 3Ds | 1=E1 | 2=B1 | 3=C2 | 4=E2 | 5=B2 | 6=C1 | SOT363 |
| BC856U | 3Ds | 1=E1 | 2=B1 | 3=C2 | 4=E2 | 5=B2 | 6=C1 | SC74 |
| BC857S | 3Cs | 1=E1 | 2=B1 | 3=C2 | 4=E2 | 5=B2 | 6=C1 | SOT363 |

¹⁾Pb-containing package may be available upon special request

Maximum Ratings

| Parameter | Symbol | Value | Unit |
|--|-----------|-------------|------|
| Collector-emitter voltage BC856S/U BC857S | V_{CEO} | 65 45 | - |
| Collector-base voltage BC856S, BC856U BC857S | V_{CBO} | 80 50 | V |
| Emitter-base voltage | V_{EBO} | 5 | |
| Collector current | I_C | 100 | mA |
| Peak collector current | I_{CM} | 200 | |
| Total power dissipation- $T_S \leq 115\text{ °C}$, BC856S $T_S \leq 118\text{ °C}$, BC856U, BC857U | P_{tot} | 250 250 | - |
| Junction temperature | T_j | 150 | °C |
| Storage temperature | T_{stg} | -65 ... 150 | |

Thermal Resistance

| Parameter | Symbol | Value | Unit |
|--|------------|--------------------------|------|
| Junction - soldering point ¹⁾ BC856S, BC857S BC856U | R_{thJS} | ≤ 140 ≤ 130 | K/W |

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

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 $I_C = 10\text{ mA}$, $I_B = 0$, BC856S/U $I_C = 10\text{ mA}$, $I_B = 0$, BC857S | $V_{(BR)CEO}$ | 65 45 | - - | - - | - |
| Collector-base breakdown voltage $I_C = 10\text{ }\mu\text{A}$, $I_E = 0$, BC856S/U $I_C = 10\text{ }\mu\text{A}$, $I_E = 0$, BC857S | $V_{(BR)CBO}$ | 80 50 | - - | - - | - |
| Emitter-base breakdown voltage $I_E = 10\text{ }\mu\text{A}$, $I_C = 0$ | $V_{(BR)EBO}$ | 5 | - | - | V |
| Collector-base cutoff current $V_{CB} = 45\text{ V}$, $I_E = 0$ $V_{CB} = 45\text{ V}$, $I_E = 0$, $T_A = 150\text{ }^\circ\text{C}$ | I_{CBO} | - - | - - | 0.015 5 | μA |
| DC current gain ¹⁾ $I_C = 10\text{ }\mu\text{A}$, $V_{CE} = 5\text{ V}$ $I_C = 2\text{ mA}$, $V_{CE} = 5\text{ V}$ | h_{FE} | - 200 | 250 290 | - 630 | - |
| 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} | - - | 75 250 | 300 650 | 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} | - - | 700 850 | - - | - |
| Base-emitter voltage ¹⁾ $I_C = 2\text{ mA}$, $V_{CE} = 5\text{ V}$ $I_C = 10\text{ mA}$, $V_{CE} = 5\text{ V}$ | $V_{BE(ON)}$ | 600 - | 650 - | 750 820 | mV |

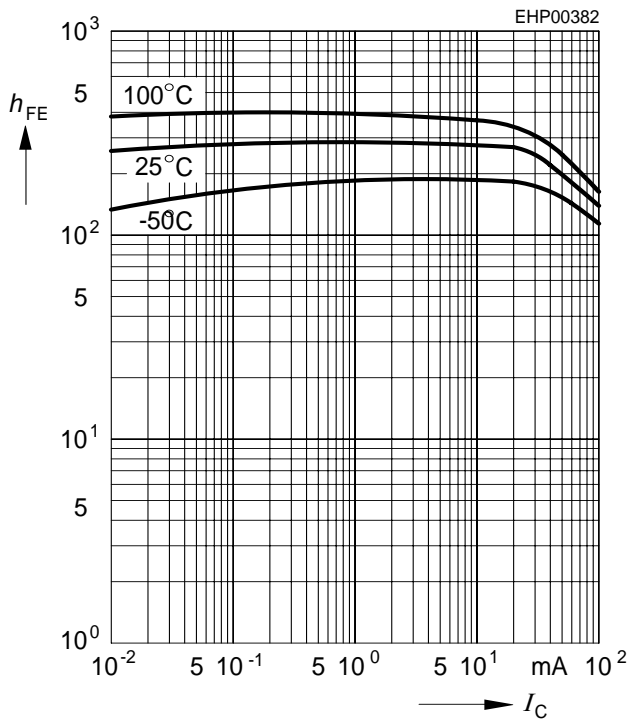
¹⁾Pulse test: $t < 300\mu\text{s}$; $D < 2\%$

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

| Parameter | Symbol | Values | | | Unit |
|---|-----------|--------|------|------|---------------|
| | | min. | typ. | max. | |
| AC Characteristics | | | | | |
| Transition frequency $I_C = 20 \text{ mA}, V_{CE} = 5 \text{ V}, f = 100 \text{ MHz}$ | f_T | - | 250 | - | MHz |
| Collector-base capacitance $V_{CB} = 10 \text{ V}, f = 1 \text{ MHz}$ | C_{cb} | - | 1.5 | - | 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 | - | k Ω |
| 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 |
| Noise figure $I_C = 200 \mu\text{A}, V_{CE} = 5 \text{ V}, f = 1 \text{ kHz},$ $\Delta f = 200 \text{ Hz}, R_S = 2 \text{ k}\Omega$ | F | - | - | 10 | dB |

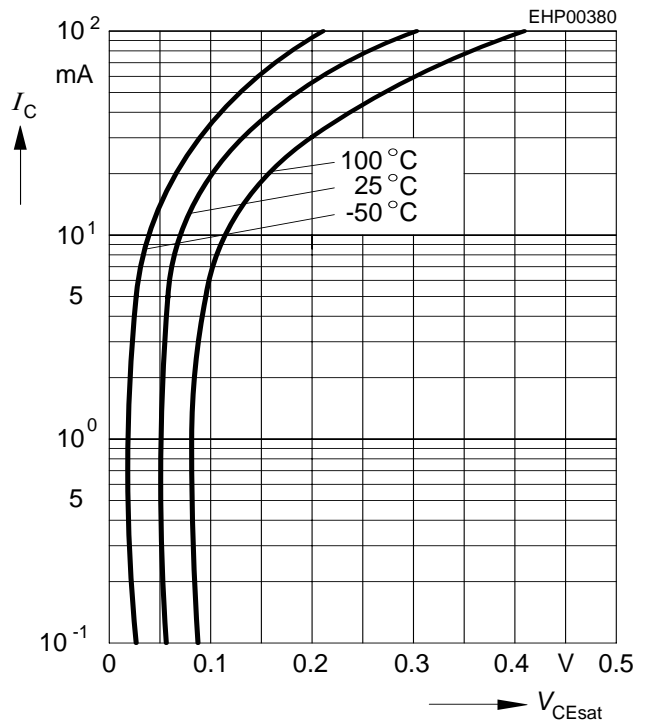
DC current gain $h_{FE} = f(I_C)$

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



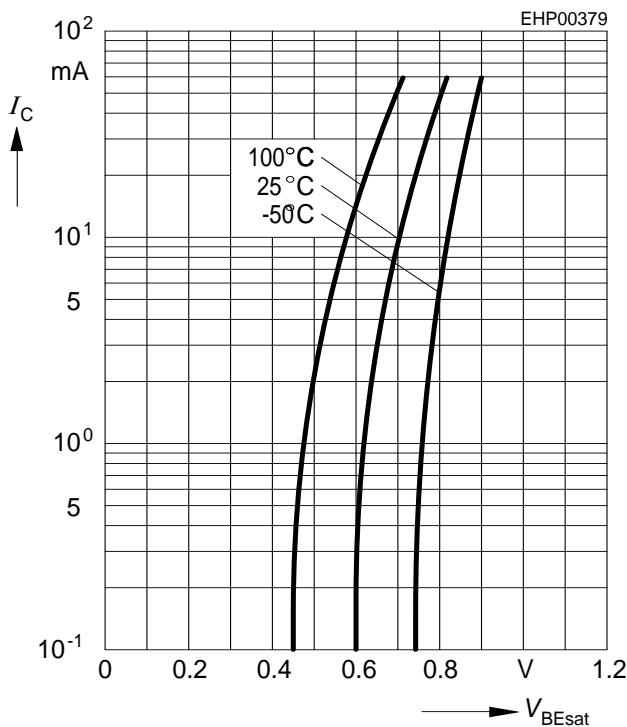
Collector-emitter saturation voltage

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



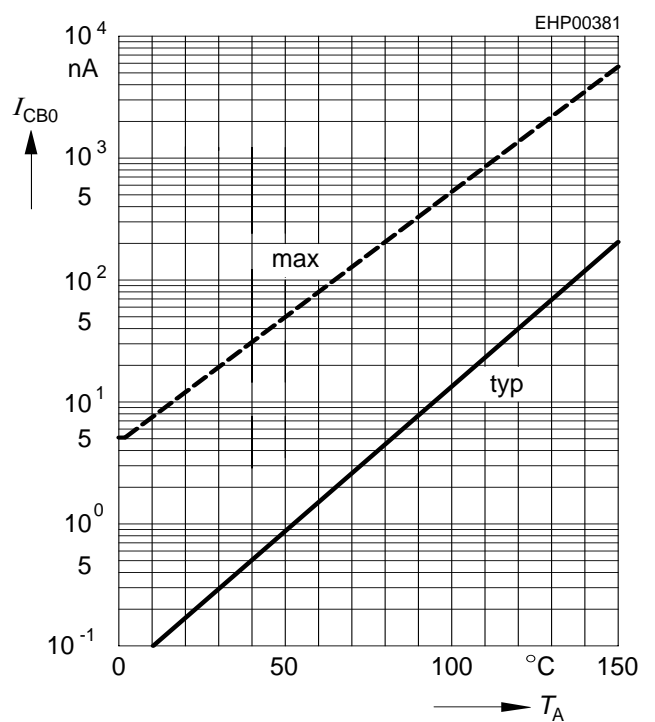
Base-emitter saturation voltage

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



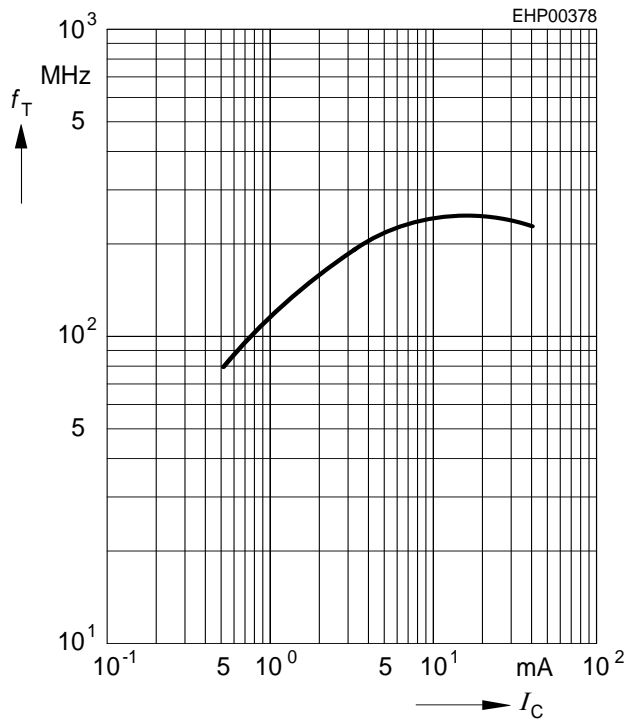
Collector cutoff current $I_{CBO} = f(T_A)$

$V_{CBO} = 30\text{ V}$



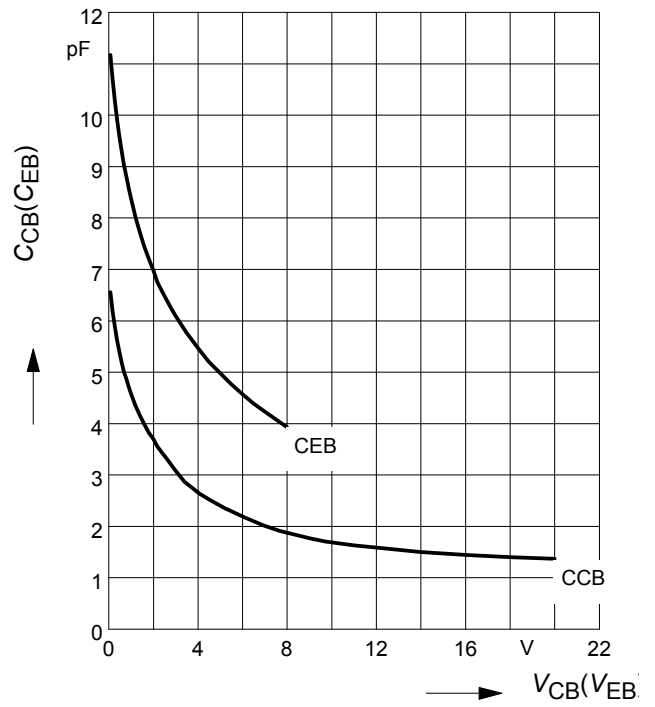
Transition frequency $f_T = f(I_C)$

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



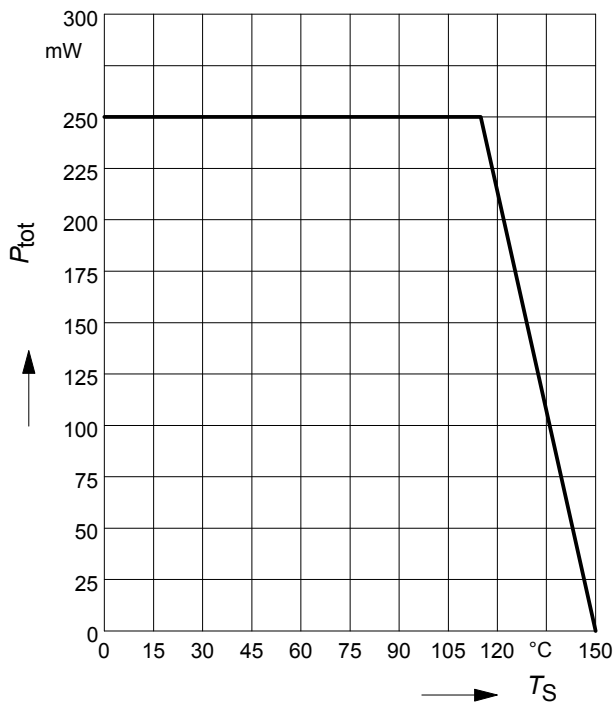
Collector-base capacitance $C_{cb} = f(V_{CB})$

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



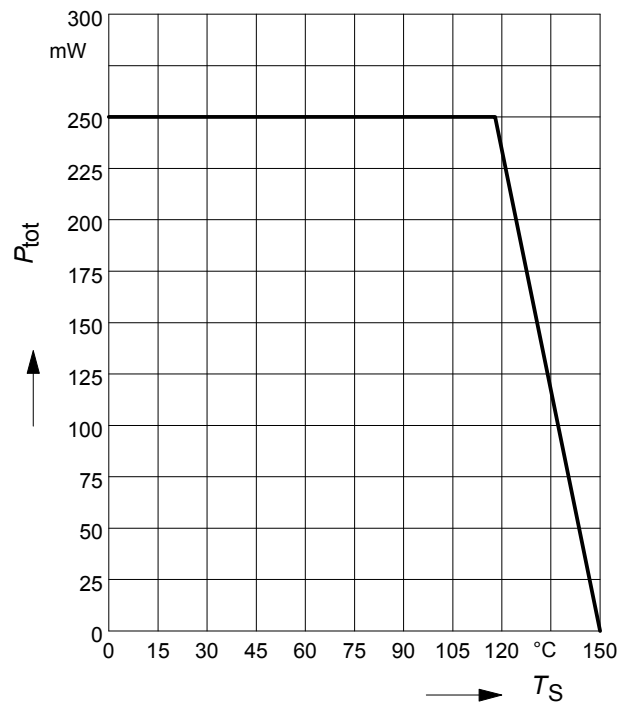
Total power dissipation $P_{tot} = f(T_S)$

BC856S, BC857S



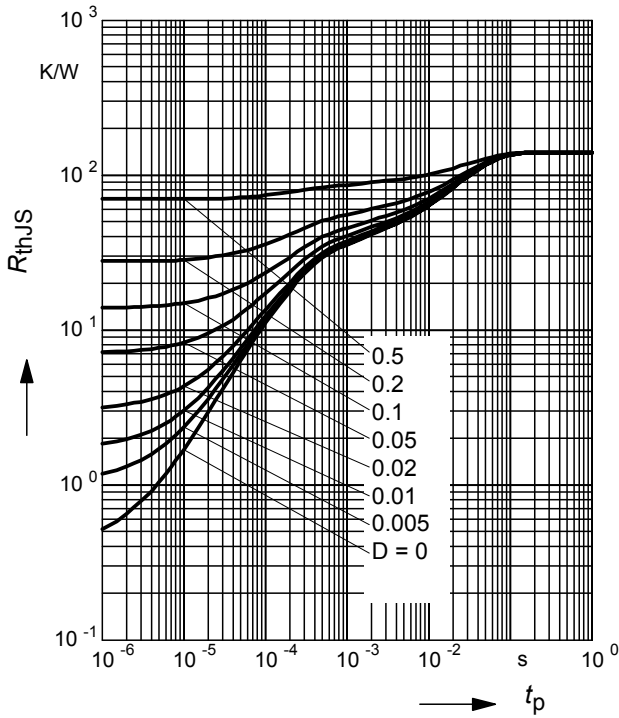
Total power dissipation $P_{tot} = f(T_S)$

BC856U



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

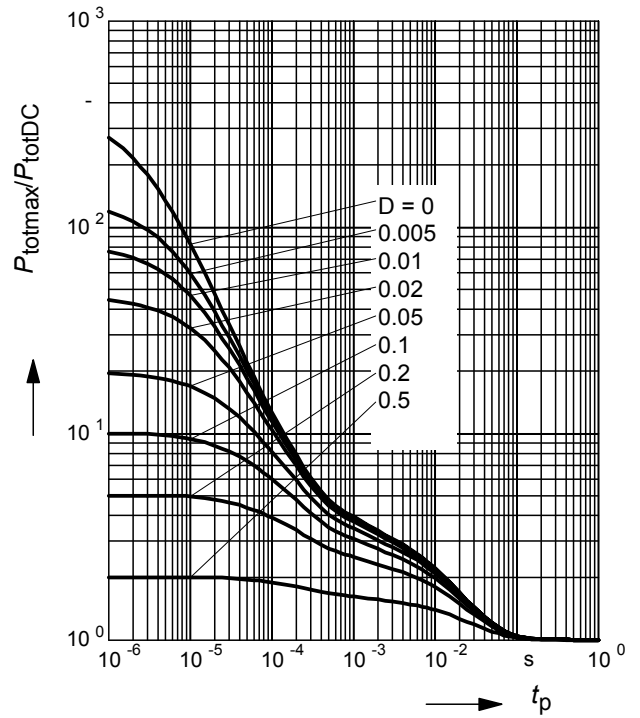
BC856S; BC857S



Permissible Pulse Load

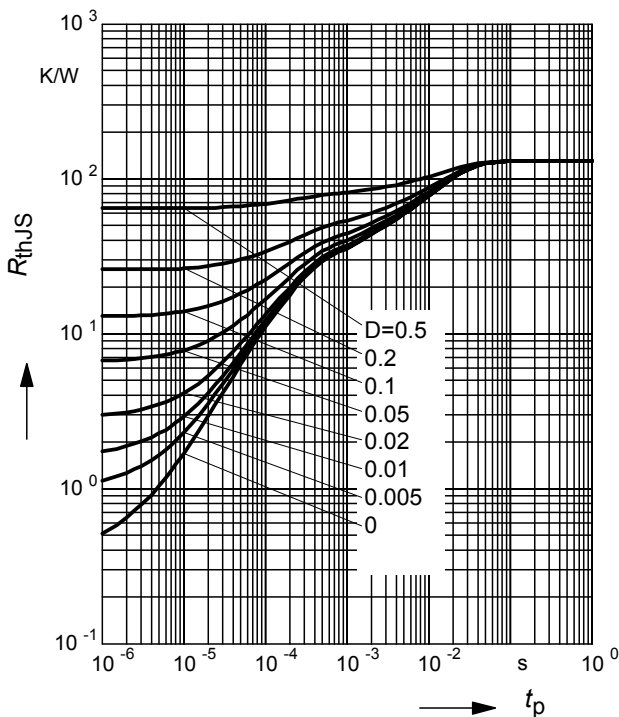
$P_{totmax}/P_{totDC} = f(t_p)$

BC856S, BC857S



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

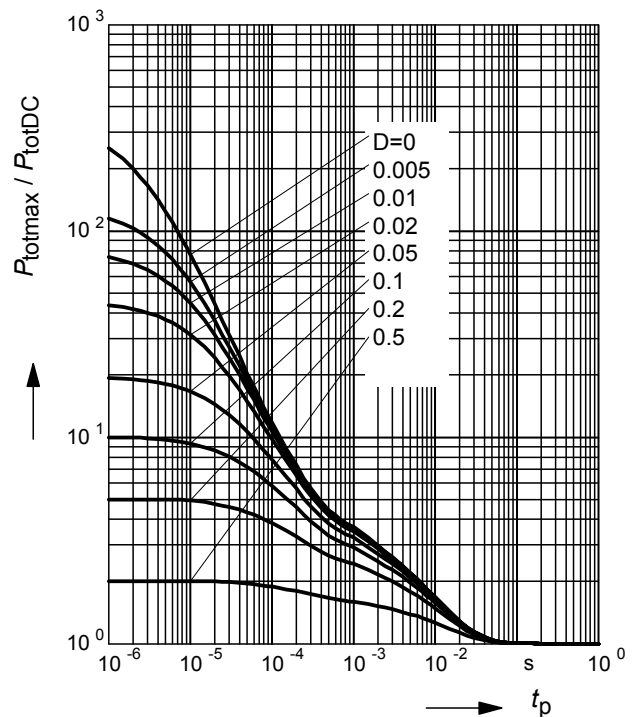
BC856U



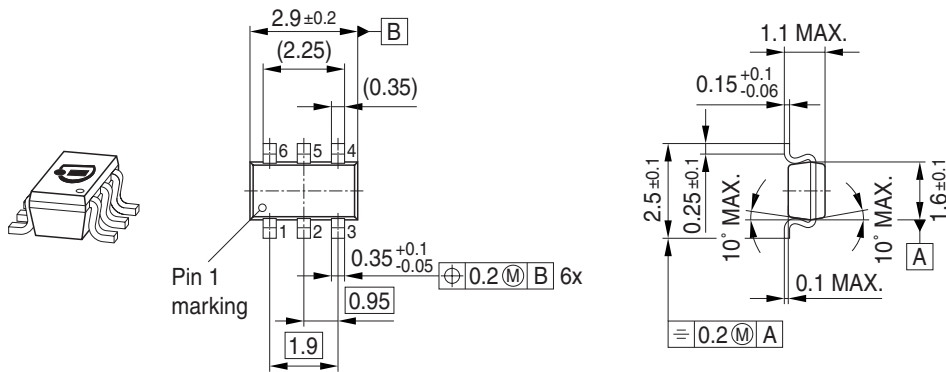
Permissible Pulse Load

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

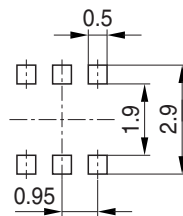
BC856U



Package Outline

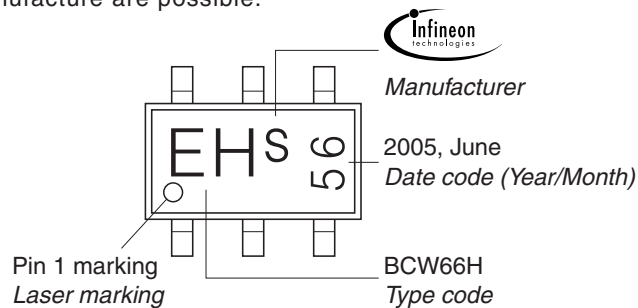


Foot Print



Marking Layout (Example)

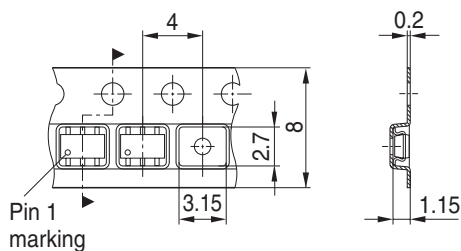
Small variations in positioning of Date code, Type code and Manufacture are possible.



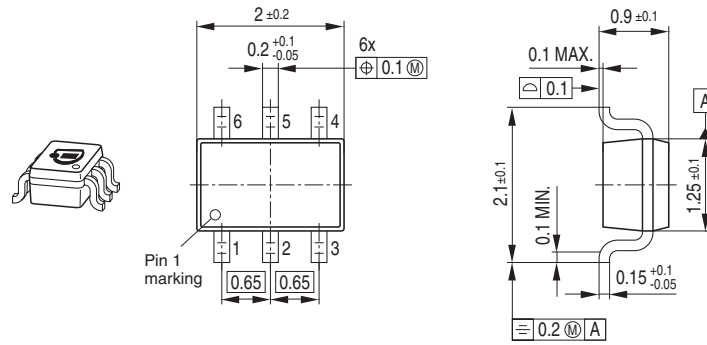
Standard Packing

Reel \varnothing 180 mm = 3.000 Pieces/Reel
 Reel \varnothing 330 mm = 10.000 Pieces/Reel

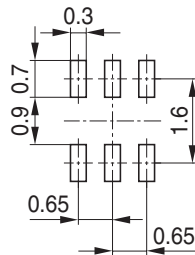
For symmetric types no defined Pin 1 orientation in reel.



Package Outline

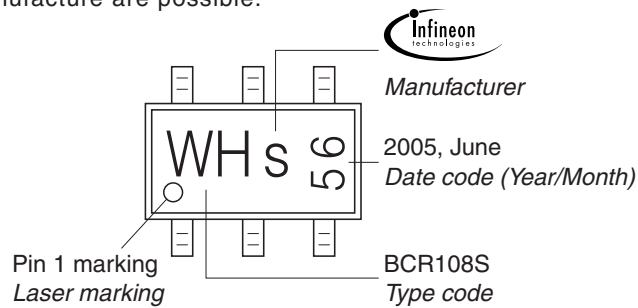


Foot Print



Marking Layout (Example)

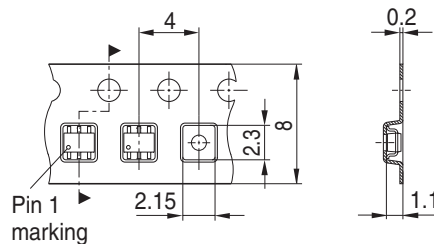
Small variations in positioning of Date code, Type code and Manufacture are possible.



Standard Packing

Reel \varnothing 180 mm = 3.000 Pieces/Reel
 Reel \varnothing 330 mm = 10.000 Pieces/Reel

For symmetric types no defined Pin 1 orientation in reel.



Edition 2006-02-01

Published by

Infineon Technologies AG

81726 München, Germany

© Infineon Technologies AG 2007.

All Rights Reserved.

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.