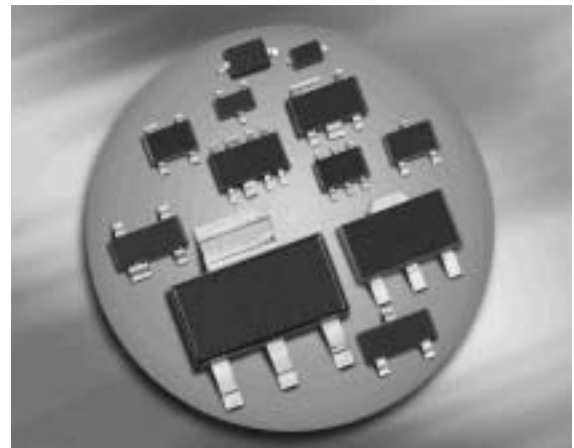
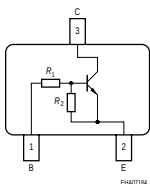


## NPN Silicon Digital Transistor

- Switching circuit, inverter, interface circuit, driver circuit
- Built in bias resistor ( $R_1=4.7k\Omega$ ,  $R_2=4.7k\Omega$ )
- BCR112U: Two internally isolated transistors with good matching in one multichip package
- BCR112U: For orientation in reel see package information below
- Pb-free (RoHS compliant) package<sup>1)</sup>
- Qualified according AEC Q101



## BCR112/F BCR112W



| Type    | Marking | Pin Configuration |     |     |   |   |   | Package |
|---------|---------|-------------------|-----|-----|---|---|---|---------|
| BCR112  | WFs     | 1=B               | 2=E | 3=C | - | - | - | SOT23   |
| BCR112F | WFs     | 1=B               | 2=E | 3=C | - | - | - | TSFP-3  |
| BCR112W | WFs     | 1=B               | 2=E | 3=C | - | - | - | SOT323  |

<sup>1)</sup>Pb-containing package may be available upon special request

**Maximum Ratings**

| Parameter                                                                                                                                          | Symbol       | Value             | Unit |
|----------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-------------------|------|
| Collector-emitter voltage                                                                                                                          | $V_{CEO}$    | 50                | V    |
| Collector-base voltage                                                                                                                             | $V_{CBO}$    | 50                |      |
| Input forward voltage                                                                                                                              | $V_{i(fwd)}$ | 30                |      |
| Input reverse voltage                                                                                                                              | $V_{i(rev)}$ | 10                |      |
| Collector current                                                                                                                                  | $I_C$        | 100               | mA   |
| Total power dissipation-<br>BCR112, $T_S \leq 102^\circ\text{C}$<br>BCR112F, $T_S \leq 128^\circ\text{C}$<br>BCR112W, $T_S \leq 124^\circ\text{C}$ | $P_{tot}$    | 200<br>250<br>250 | mW   |
| Junction temperature                                                                                                                               | $T_j$        | 150               |      |
| Storage temperature                                                                                                                                | $T_{stg}$    | -65 ... 150       |      |
|                                                                                                                                                    |              |                   |      |

**Thermal Resistance**

| Parameter                                                                | Symbol     | Value                                      | Unit |
|--------------------------------------------------------------------------|------------|--------------------------------------------|------|
| Junction - soldering point <sup>1)</sup><br>BCR112<br>BCR112F<br>BCR112W | $R_{thJS}$ | $\leq 240$<br>$\leq 90$<br>$\leq 105$<br>- | K/W  |
|                                                                          |            |                                            |      |
|                                                                          |            |                                            |      |
|                                                                          |            |                                            |      |

<sup>1</sup>For calculation of  $R_{thJA}$  please refer to Application Note Thermal Resistance

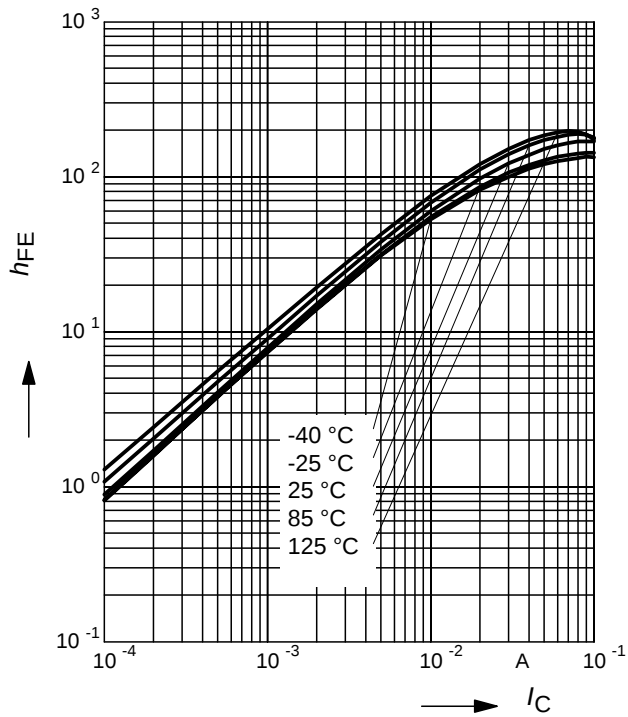
**Electrical Characteristics** at  $T_A = 25^\circ\text{C}$ , unless otherwise specified

| Parameter                                                                                             | Symbol                      | Values |      |      | Unit |
|-------------------------------------------------------------------------------------------------------|-----------------------------|--------|------|------|------|
|                                                                                                       |                             | min.   | typ. | max. |      |
| DC Characteristics                                                                                    |                             |        |      |      |      |
| Collector-emitter breakdown voltage<br>$I_C = 100\ \mu\text{A}$ , $I_B = 0$                           | $V_{(\text{BR})\text{CEO}}$ | 50     | -    | -    | V    |
| Collector-base breakdown voltage<br>$I_C = 10\ \mu\text{A}$ , $I_E = 0$                               | $V_{(\text{BR})\text{CBO}}$ | 50     | -    | -    |      |
| Collector-base cutoff current<br>$V_{\text{CB}} = 40\ \text{V}$ , $I_E = 0$                           | $I_{\text{CBO}}$            | -      | -    | 100  | nA   |
| Emitter-base cutoff current<br>$V_{\text{EB}} = 10\ \text{V}$ , $I_C = 0$                             | $I_{\text{EBO}}$            | -      | -    | 1.61 | mA   |
| DC current gain <sup>1)</sup><br>$I_C = 5\ \text{mA}$ , $V_{\text{CE}} = 5\ \text{V}$                 | $h_{\text{FE}}$             | 20     | -    | -    | -    |
| Collector-emitter saturation voltage <sup>1)</sup><br>$I_C = 10\ \text{mA}$ , $I_B = 0.5\ \text{mA}$  | $V_{\text{CEsat}}$          | -      | -    | 0.3  | V    |
| Input off voltage<br>$I_C = 100\ \mu\text{A}$ , $V_{\text{CE}} = 5\ \text{V}$                         | $V_{\text{i(off)}}$         | 0.8    | -    | 1.5  |      |
| Input on voltage<br>$I_C = 2\ \text{mA}$ , $V_{\text{CE}} = 0.3\ \text{V}$                            | $V_{\text{i(on)}}$          | 1      | -    | 2.5  |      |
| Input resistor                                                                                        | $R_1$                       | 3.2    | 4.7  | 6.2  | kΩ   |
| Resistor ratio                                                                                        | $R_1/R_2$                   | 0.9    | 1    | 1.1  | -    |
| AC Characteristics                                                                                    |                             |        |      |      |      |
| Transition frequency<br>$I_C = 10\ \text{mA}$ , $V_{\text{CE}} = 5\ \text{V}$ , $f = 100\ \text{MHz}$ | $f_{\text{T}}$              | -      | 140  | -    | MHz  |
| Collector-base capacitance<br>$V_{\text{CB}} = 10\ \text{V}$ , $f = 1\ \text{MHz}$                    | $C_{\text{cb}}$             | -      | 3    | -    | pF   |

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

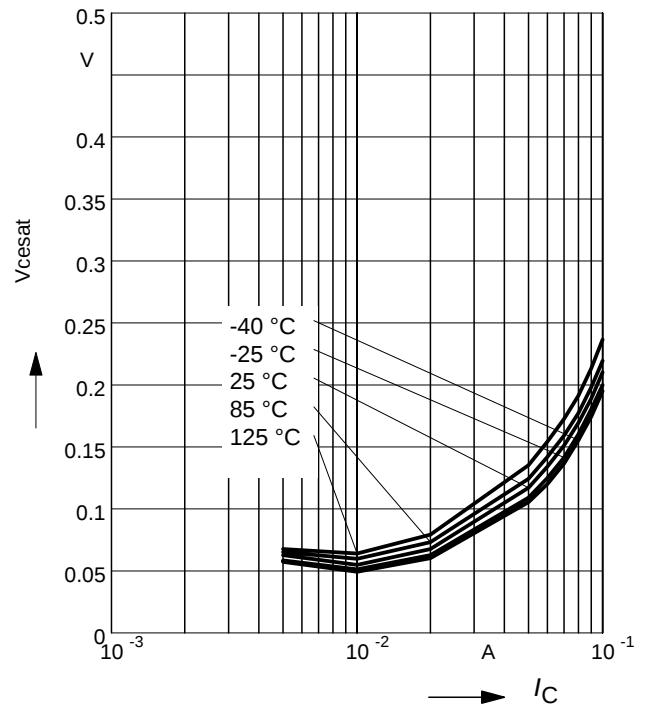
**DC current gain  $h_{FE} = f(I_C)$**

$V_{CE} = 5 \text{ V}$  (common emitter configuration)



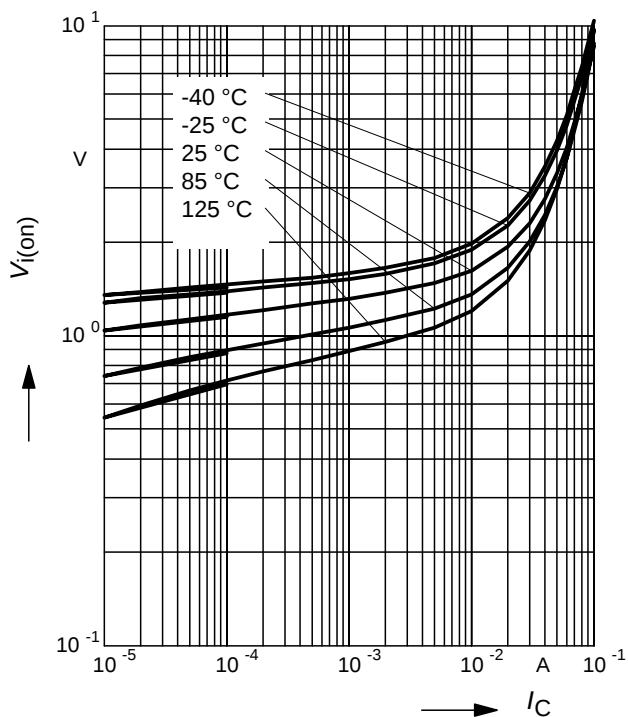
**Collector-emitter saturation voltage**

$V_{CEsat} = f(I_C), I_C/I_B = 20$



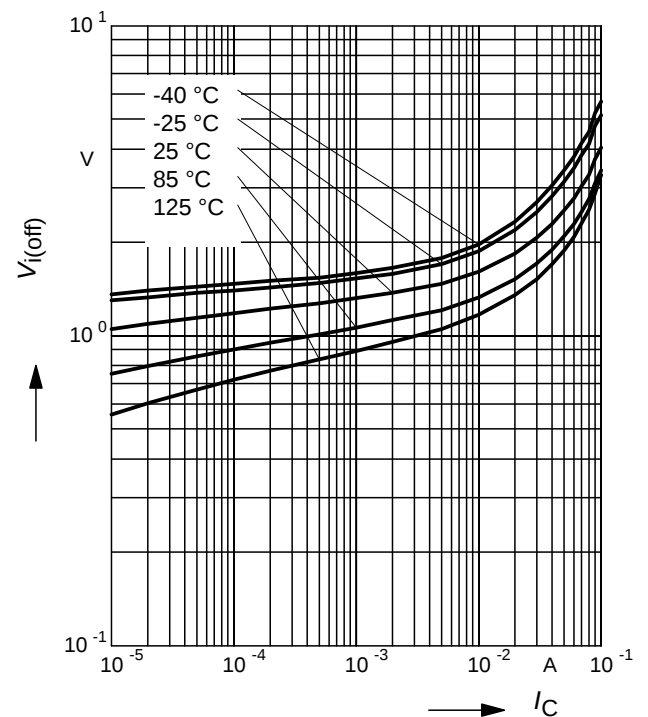
**Input on Voltage  $V_{i(on)} = f(I_C)$**

$V_{CE} = 0.3 \text{ V}$  (common emitter configuration)



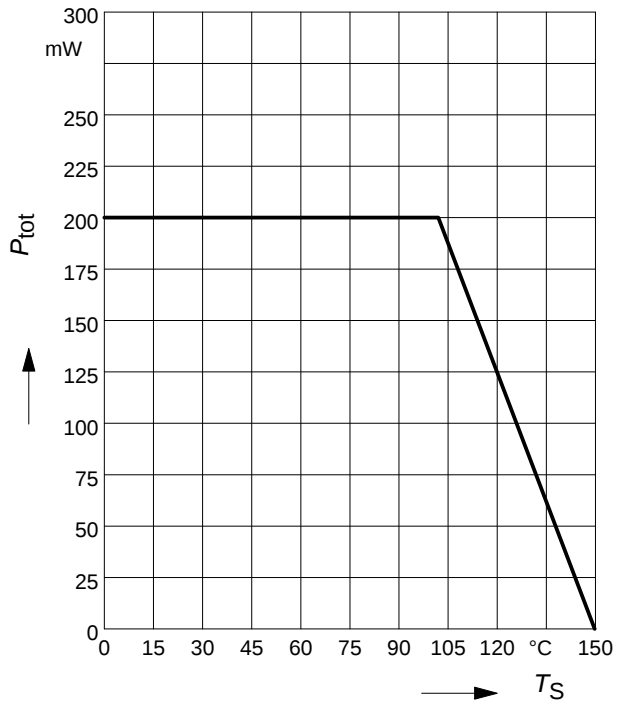
**Input off voltage  $V_{i(off)} = f(I_C)$**

$V_{CE} = 5 \text{ V}$  (common emitter configuration)



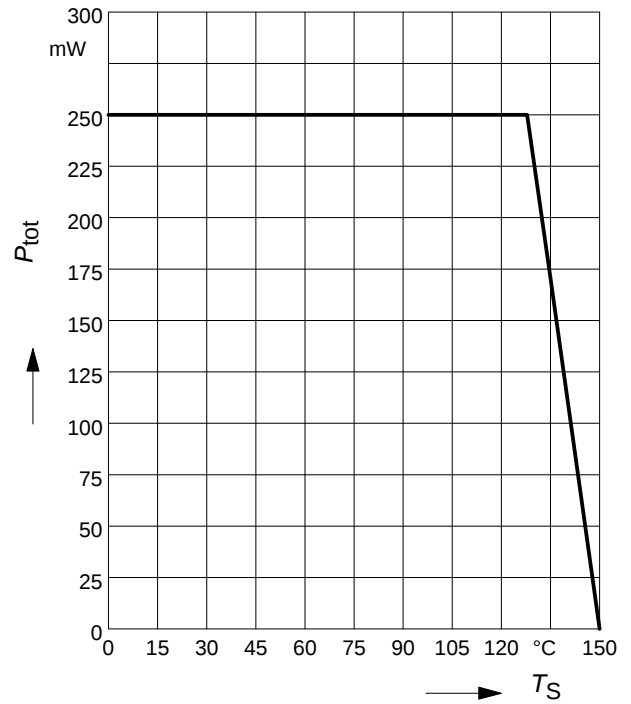
Total power dissipation  $P_{\text{tot}} = f(T_S)$

BCR112



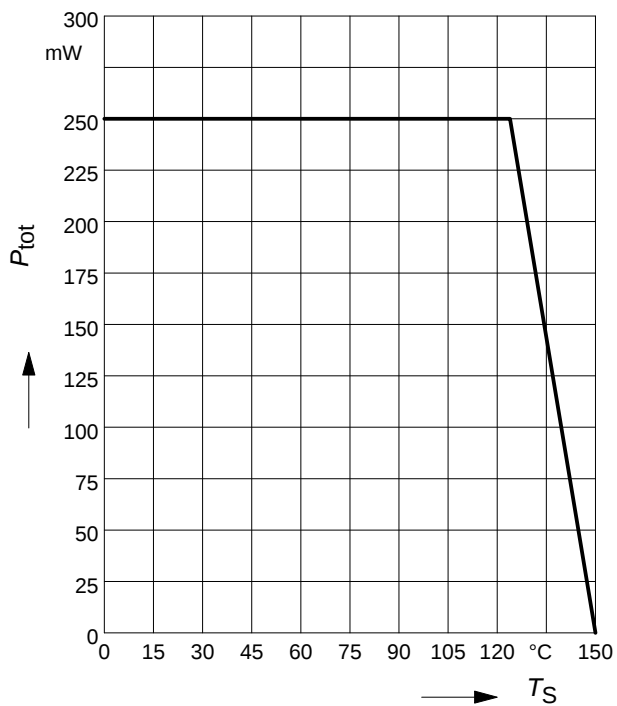
Total power dissipation  $P_{\text{tot}} = f(T_S)$

BCR112F



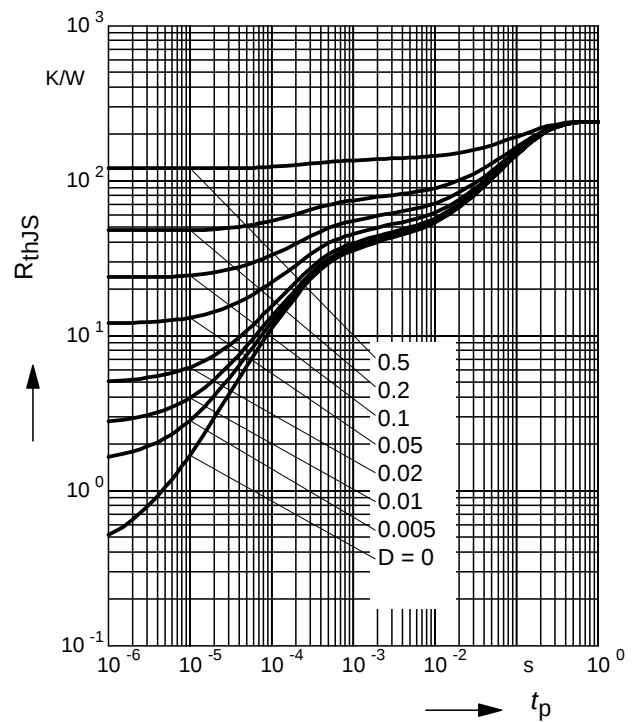
Total power dissipation  $P_{\text{tot}} = f(T_S)$

BCR112W



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

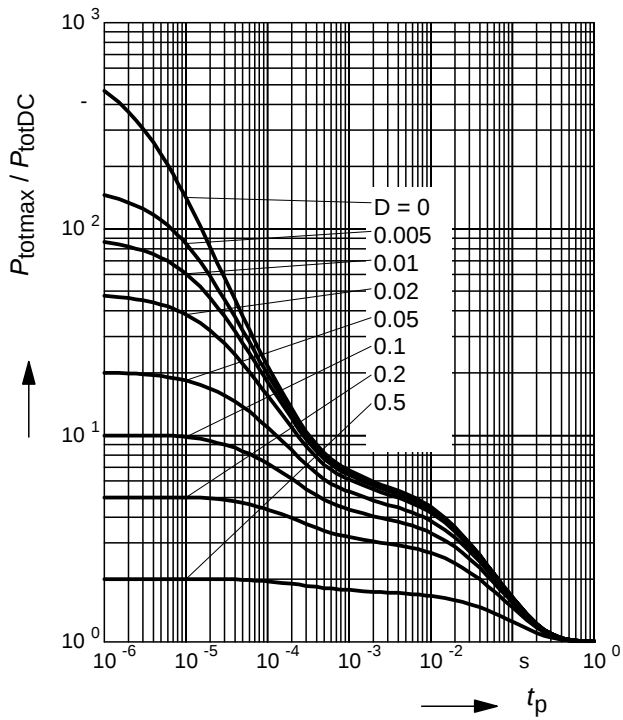
BCR112



### Permissible Pulse Load

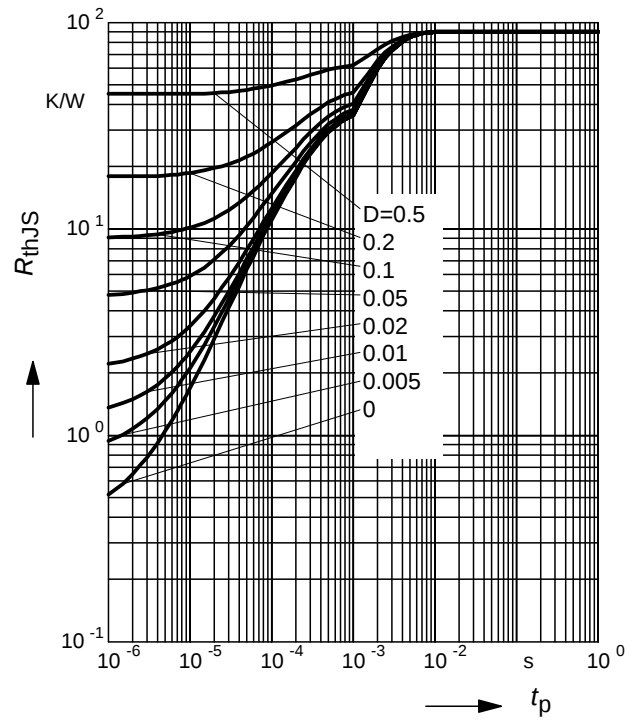
$$P_{\text{totmax}}/P_{\text{totDC}} = f(t_p)$$

BCR112



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

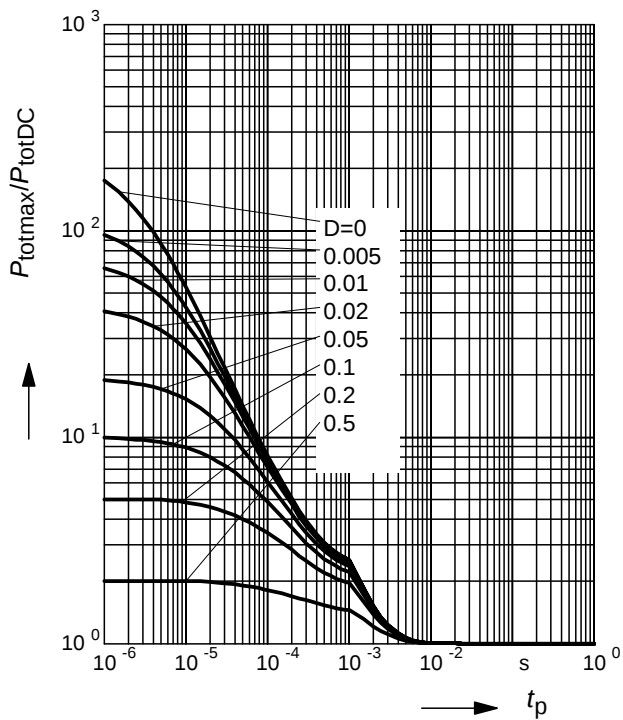
BCR112F



### Permissible Pulse Load

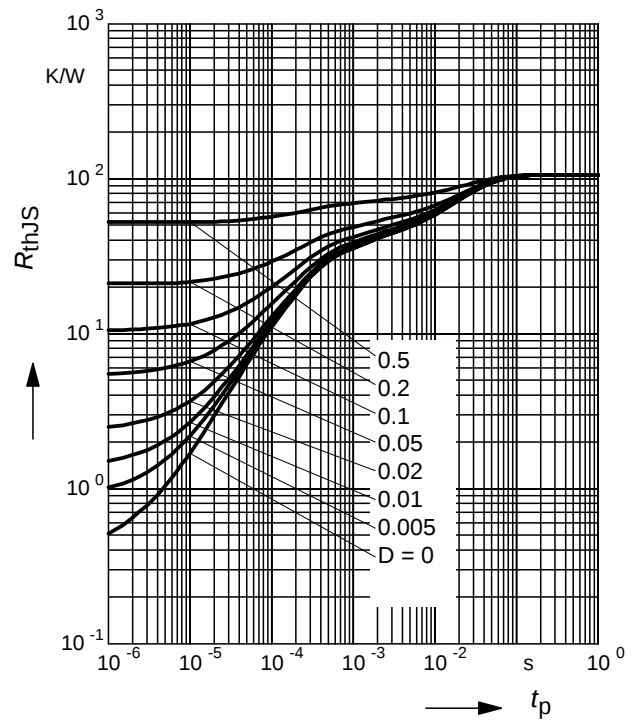
$$P_{\text{totmax}}/P_{\text{totDC}} = f(t_p)$$

BCR112F



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

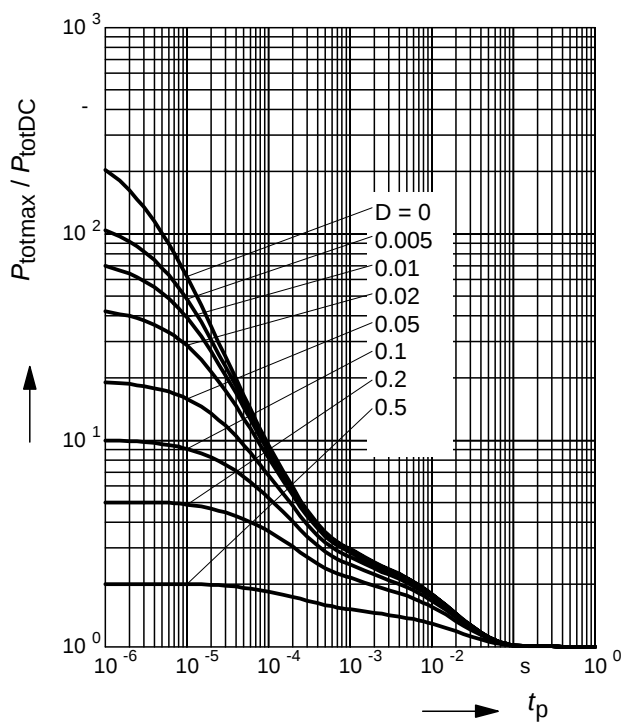
BCR112W



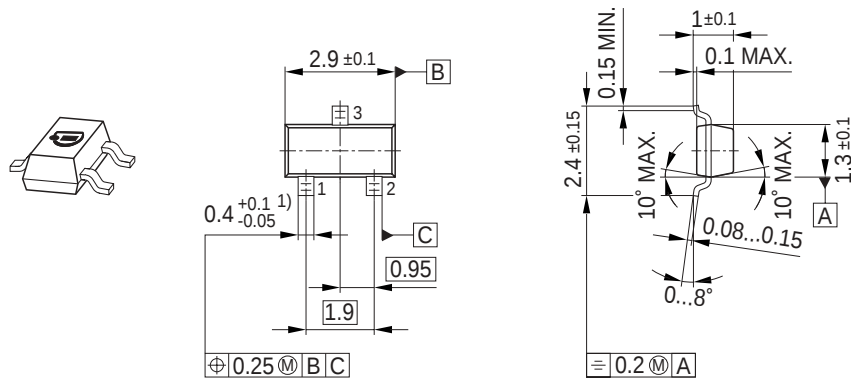
# Permissible Pulse Load

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

BCR112W

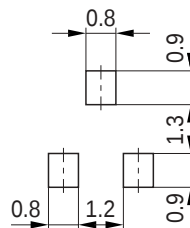


## Package Outline

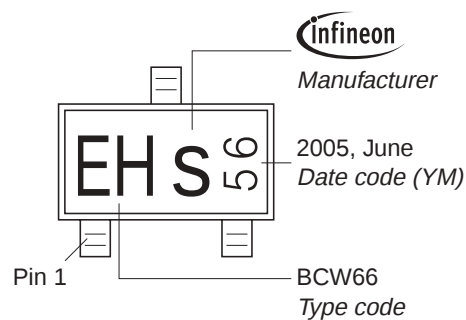


1) Lead width can be 0.6 max. in dambar area

## Foot Print

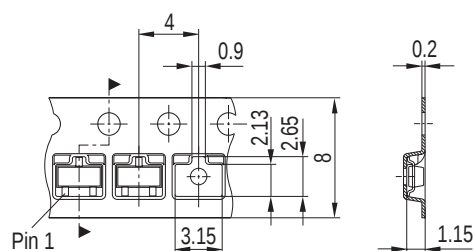


## Marking Layout (Example)

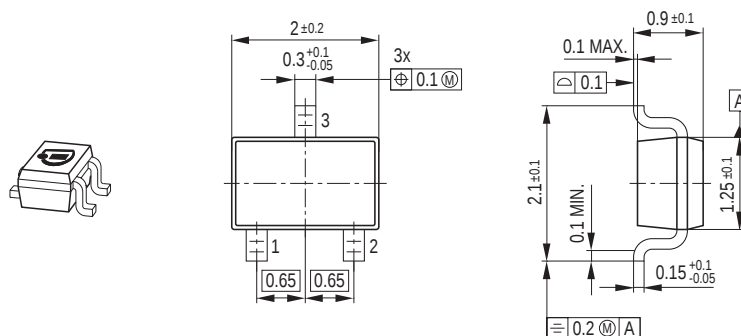


## Standard Packing

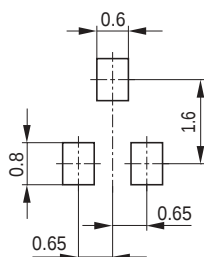
Reel ø180 mm = 3.000 Pieces/Reel  
Reel ø330 mm = 10.000 Pieces/Reel



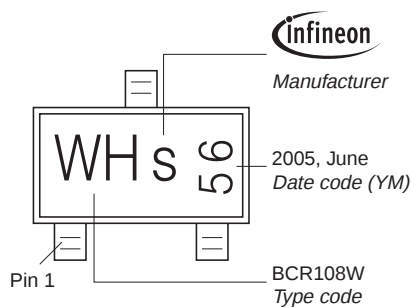
## Package Outline



## Foot Print

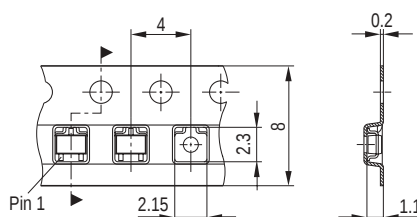


## Marking Layout (Example)

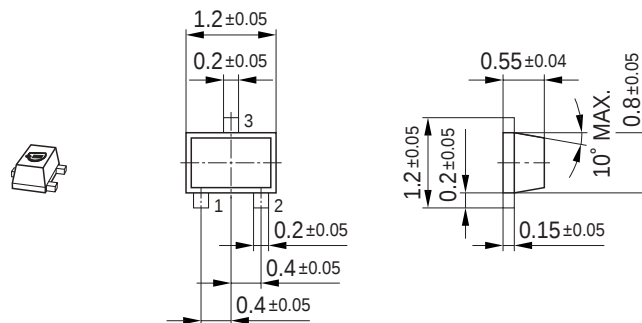


## Standard Packing

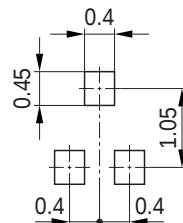
Reel  $\varnothing 180 \text{ mm}$  = 3.000 Pieces/Reel  
 Reel  $\varnothing 330 \text{ mm}$  = 10.000 Pieces/Reel



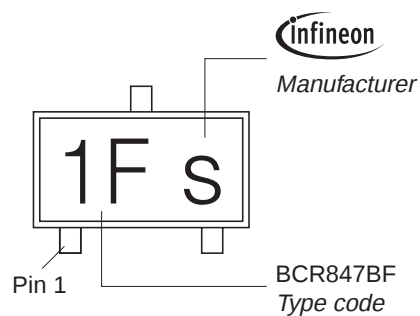
## Package Outline



## Foot Print

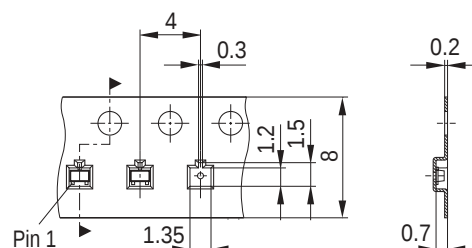


## Marking Layout (Example)



## Standard Packing

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



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- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



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