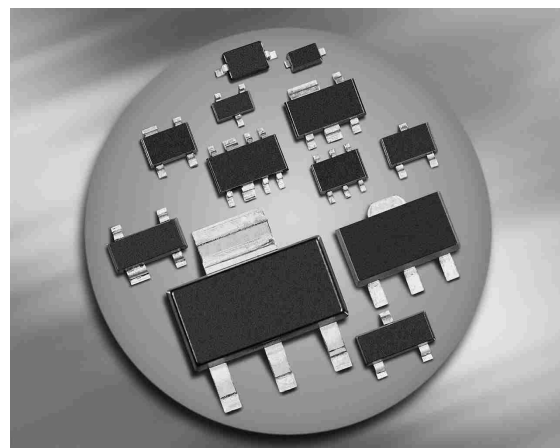


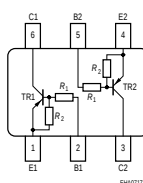
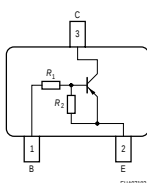
## PNP Silicon Digital Transistor

- Switching circuit, inverter, interface circuit, driver circuit
- Built in bias resistor ( $R_1 = 47\text{ k}\Omega$  ,  $R_2 = 47\text{ k}\Omega$  )
- BCR198S: Two internally isolated transistors with good matching in one multichip package
- BCR198S: For orientation in reel see package information below
- Pb-free (RoHS compliant) package <sup>1)</sup>
- Qualified according AEC Q101



### BCR198/F BCR198W

### BCR198S



| Type    | Marking | Pin Configuration |      |      |      |      |      | Package |
|---------|---------|-------------------|------|------|------|------|------|---------|
| BCR198  | WRs     | 1=B               | 2=E  | 3=C  | -    | -    | -    | SOT23   |
| BCR198F | WRs     | 1=B               | 2=E  | 3=C  | -    | -    | -    | TSFP-3  |
| BCR198S | WRs     | 1=E1              | 2=B1 | 3=C2 | 4=E2 | 5=B2 | 6=C1 | SOT363  |
| BCR198W | WRs     | 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                                                                                                                                                                       | $V_{i(fwd)}$ | 80                       |      |
| Input reverse voltage                                                                                                                                                                       | $V_{i(rev)}$ | 10                       |      |
| Collector current                                                                                                                                                                           | $I_C$        | 100                      | mA   |
| Total power dissipation-<br>BCR198, $T_S \leq 102^\circ\text{C}$<br>BCR198F, $T_S \leq 128^\circ\text{C}$<br>BCR198S, $T_S \leq 115^\circ\text{C}$<br>BCR198W, $T_S \leq 124^\circ\text{C}$ | $P_{tot}$    | 200<br>250<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> | $R_{thJS}$ |            | K/W  |
| BCR198                                   |            | $\leq 240$ |      |
| BCR198F                                  |            | $\leq 90$  |      |
| BCR198S                                  |            | $\leq 140$ |      |
| BCR198W                                  |            | $\leq 105$ |      |

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

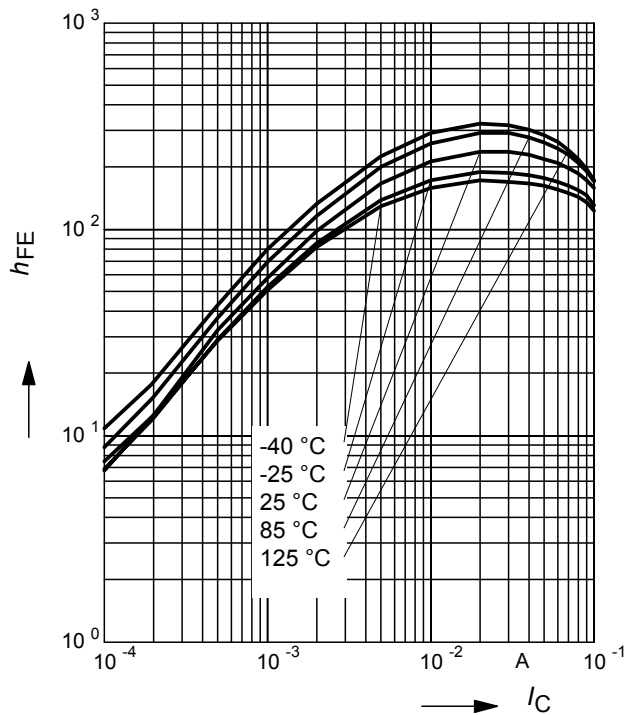
**Electrical Characteristics** at  $T_A = 25^\circ\text{C}$ , unless otherwise specified

| 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>$V_{\text{EB}} = 10\ \text{V}$ , $I_C = 0$                             | $I_{\text{EBO}}$            | -      | -    | 164  | $\mu\text{A}$ |
| DC current gain <sup>1)</sup><br>$I_C = 5\ \text{mA}$ , $V_{\text{CE}} = 5\ \text{V}$                 | $h_{\text{FE}}$             | 70     | -    | -    | -             |
| 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      | -    | 3    |               |
| Input resistor                                                                                        | $R_1$                       | 32     | 47   | 62   | k $\Omega$    |
| Resistor ratio                                                                                        | $R_1/R_2$                   | 0.9    | 1    | 1.1  | -             |
| AC Characteristics                                                                                    |                             |        |      |      |               |
| Transition frequency<br>$I_C = 10\ \text{mA}$ , $V_{\text{CE}} = 5\ \text{V}$ , $f = 100\ \text{MHz}$ | $f_{\text{T}}$              | -      | 190  | -    | 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:  $t < 300\ \mu\text{s}$ ;  $D < 2\%$

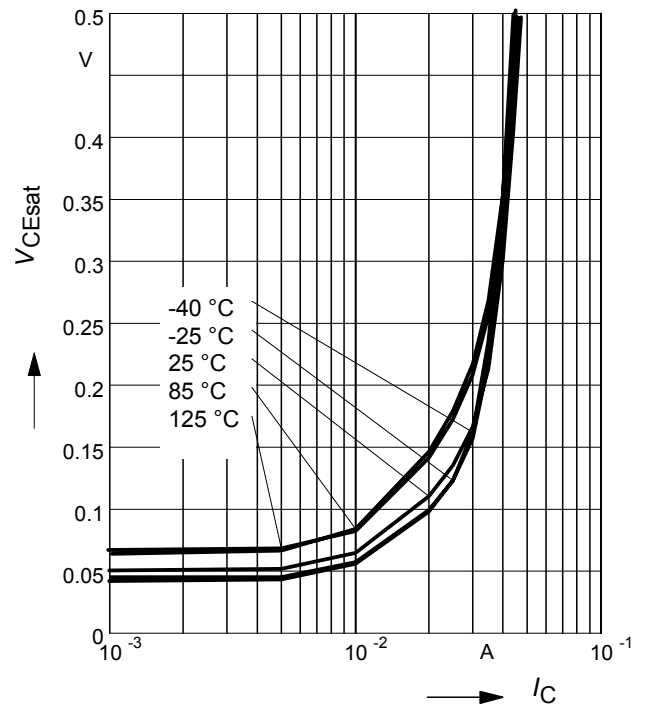
**DC current gain  $h_{FE} = f(I_C)$**

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



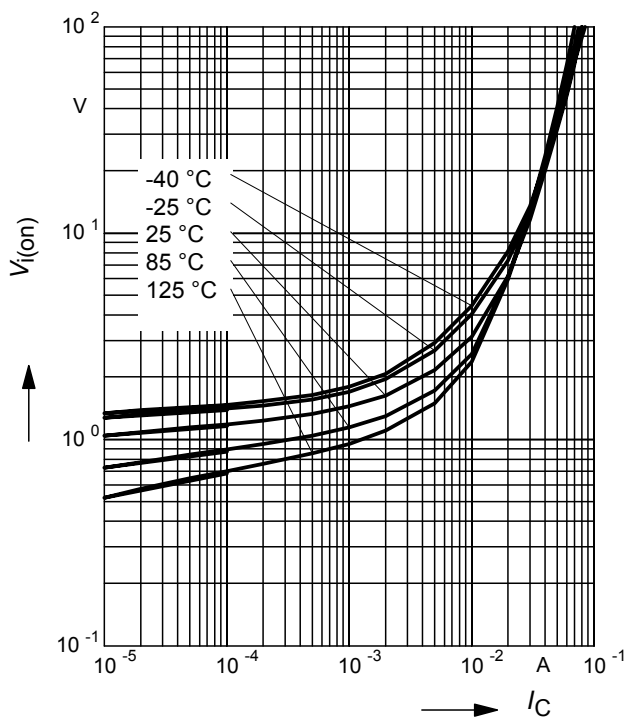
**Collector-emitter saturation voltage**

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



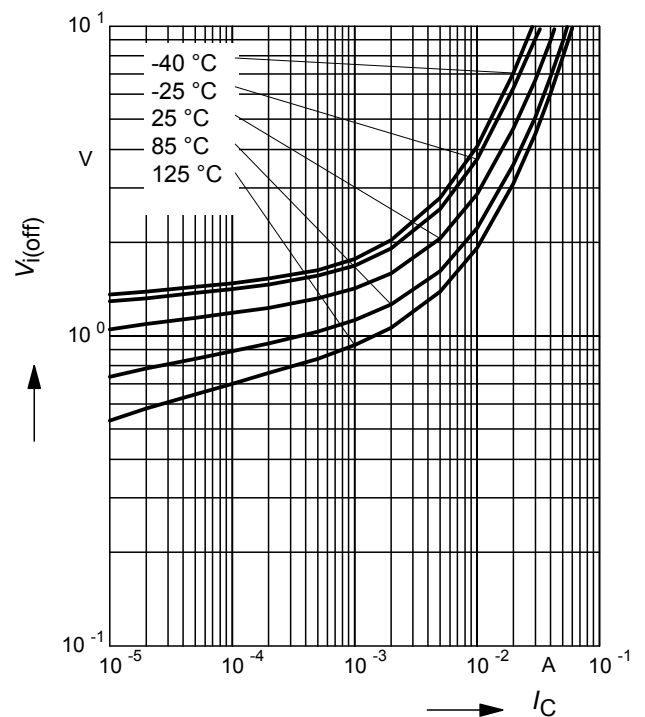
**Input on Voltage  $V_{i(on)} = f(I_C)$**

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



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

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



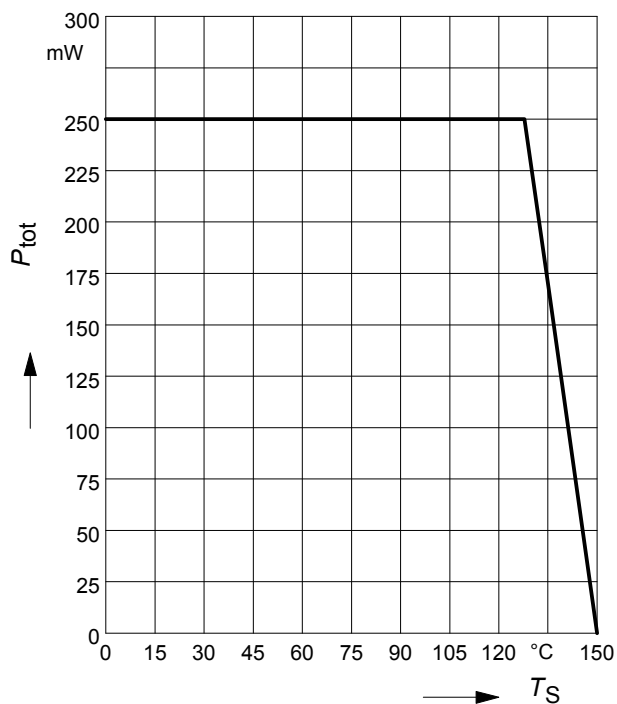
**Total power dissipation  $P_{\text{tot}} = f(T_S)$**

**BCR198**



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

**BCR198F**



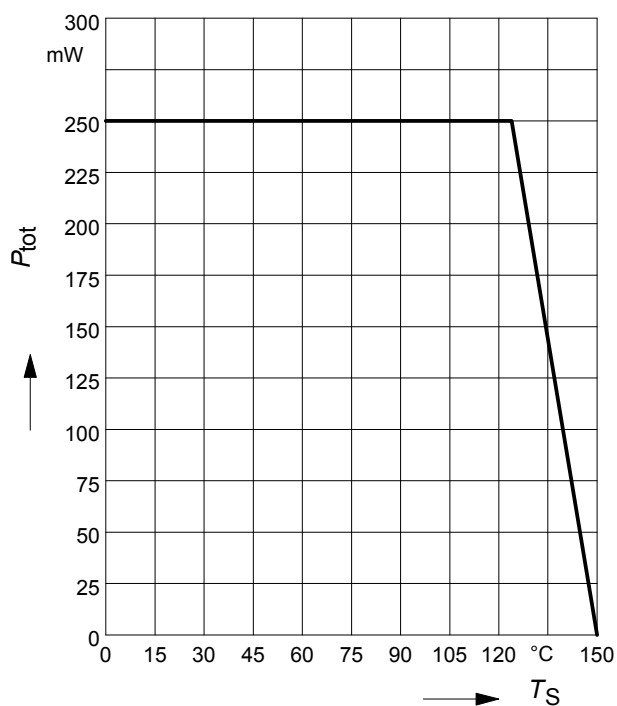
**Total power dissipation  $P_{\text{tot}} = f(T_S)$**

**BCR198S**



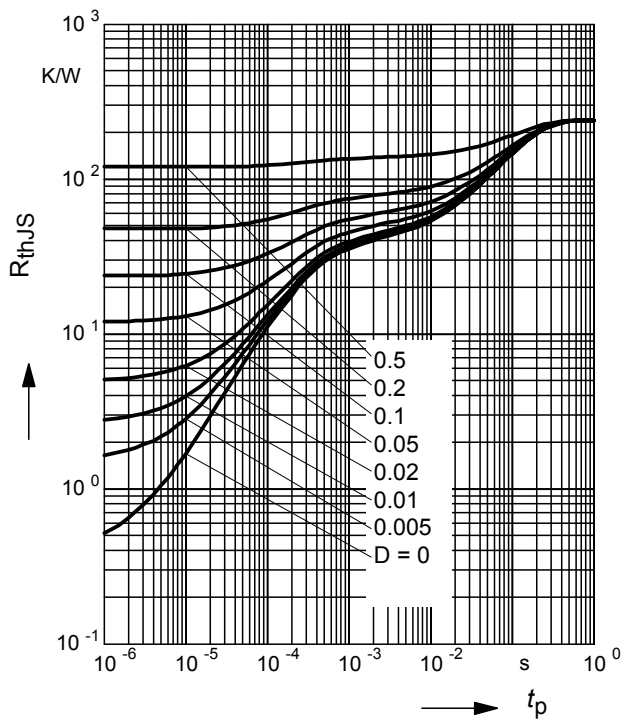
**Total power dissipation  $P_{\text{tot}} = f(T_S)$**

**BCR198W**



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

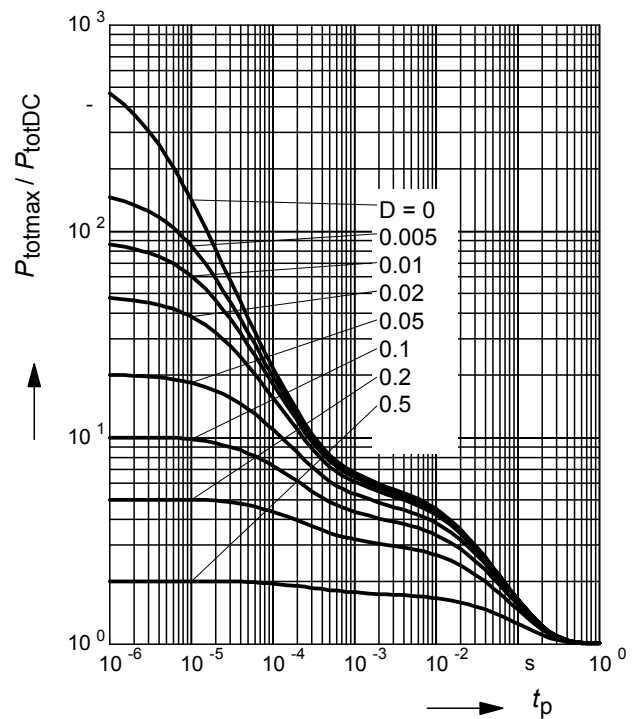
BCR198



### Permissible Pulse Load

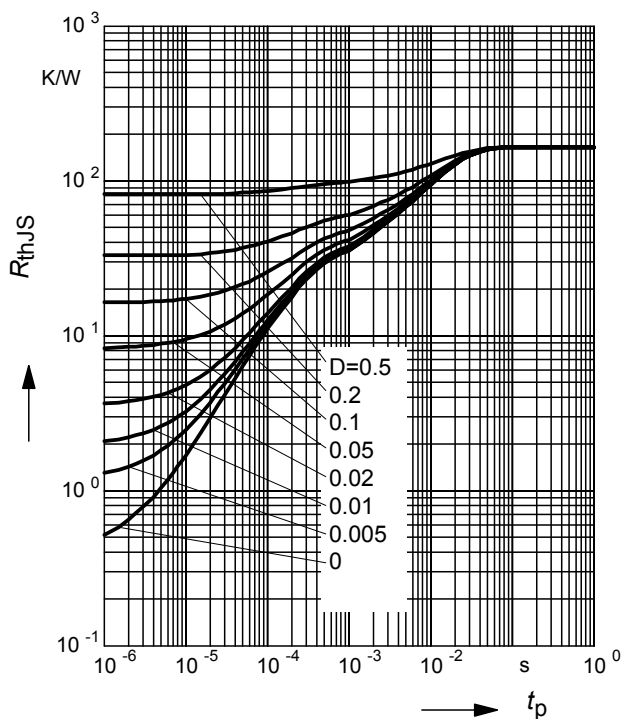
$$P_{totmax}/P_{totDC} = f(t_p)$$

BCR198



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

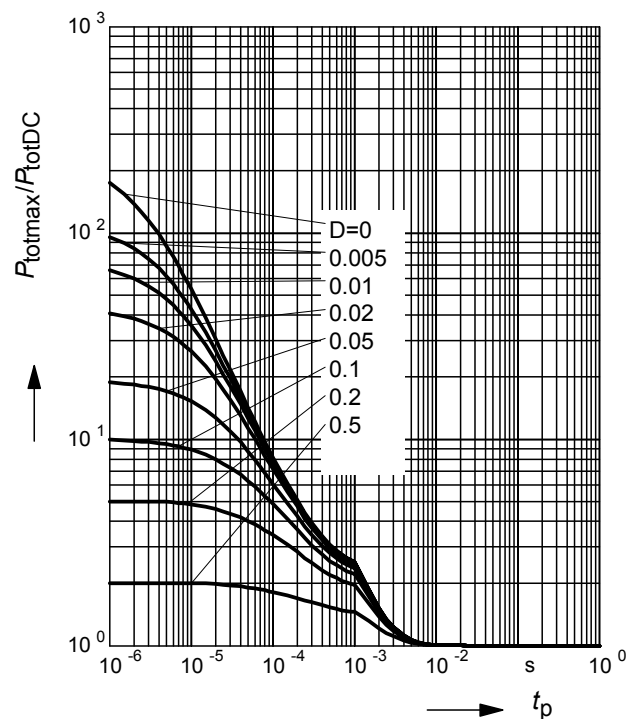
BCR198F



### Permissible Pulse Load

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

BCR198F



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

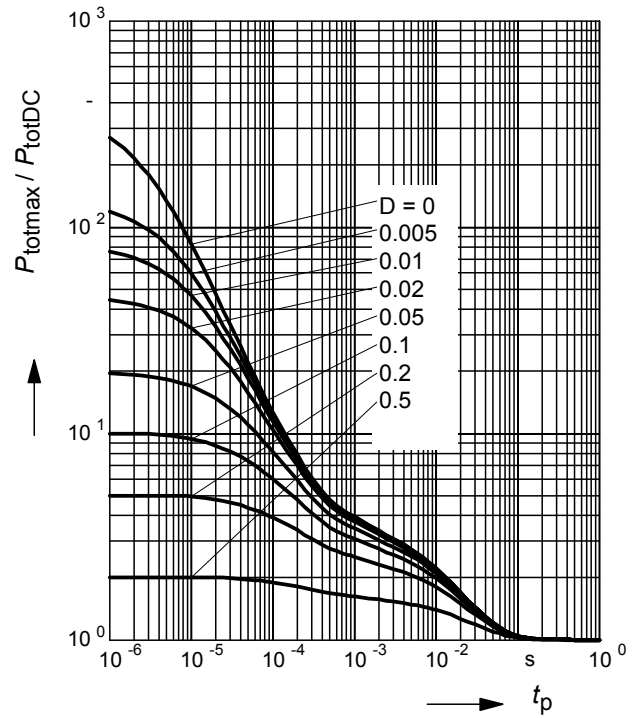
BCR198S



**Permissible Pulse Load**

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

BCR198S



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

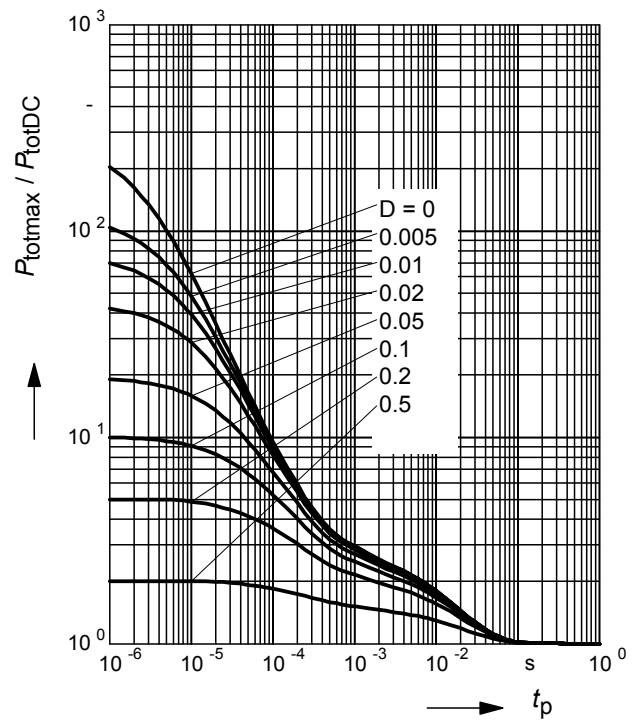
BCR198W



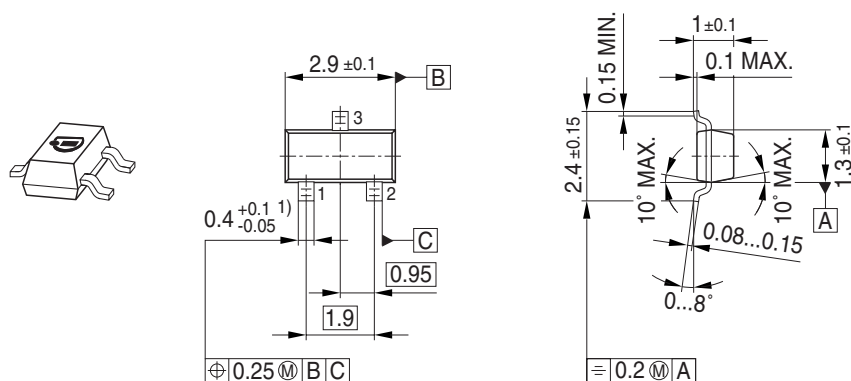
**Permissible Pulse Load**

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

BCR198W



## Package Outline

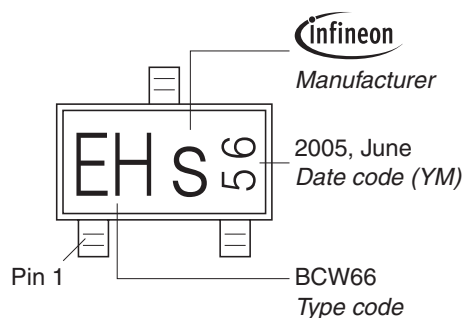


1) Lead width can be 0.6 max. in dambar area

## Foot Print

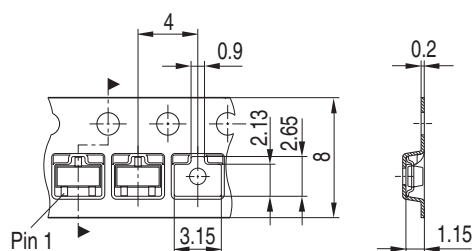


## Marking Layout (Example)

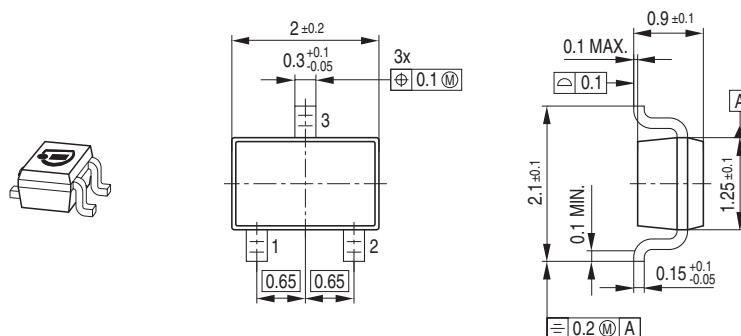


## Standard Packing

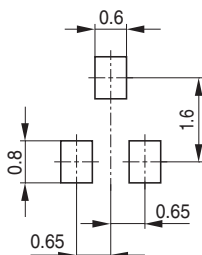
Reel ø180 mm = 3.000 Pieces/Reel  
Reel ø330 mm = 10.000 Pieces/Reel



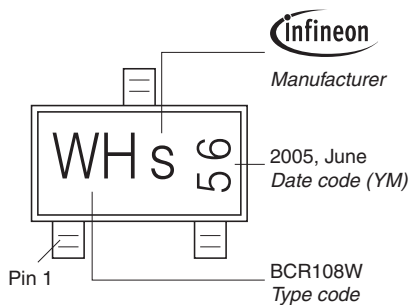
## Package Outline



## Foot Print

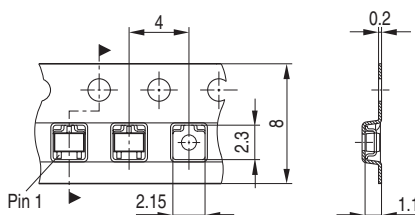


## Marking Layout (Example)

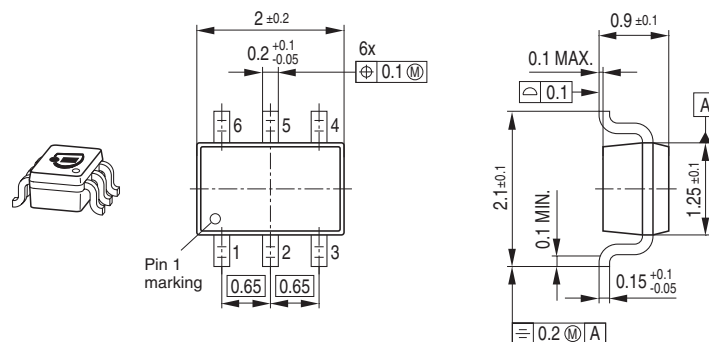


## Standard Packing

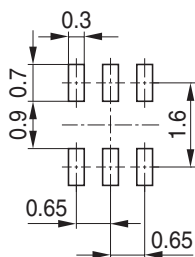
Reel  $\varnothing 180$  mm = 3.000 Pieces/Reel  
 Reel  $\varnothing 330$  mm = 10.000 Pieces/Reel



## Package Outline

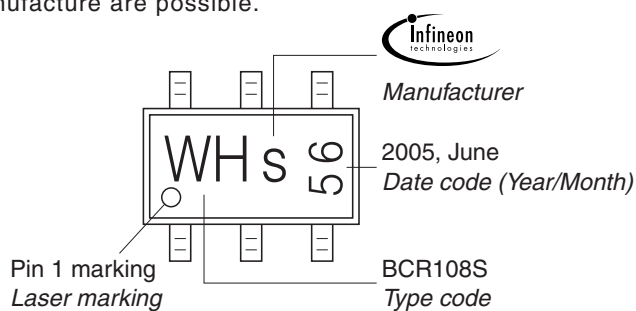


## Foot Print



## Marking Layout (Example)

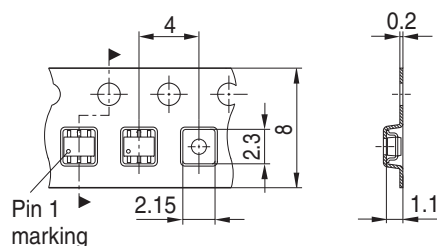
Small variations in positioning of Date code, Type code and Manufacture are possible.



## 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.



## Package Outline



## 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

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