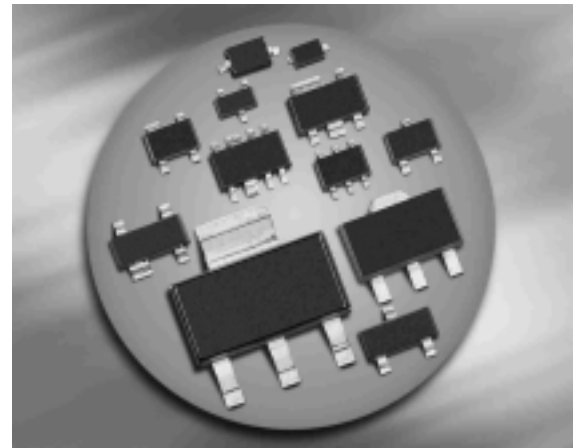


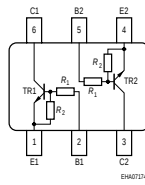
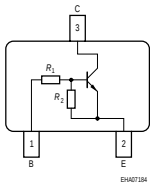
## NPN Silicon Digital Transistor

- Switching circuit, inverter, interface circuit, driver circuit
- Built in bias resistor ( $R_1=4.7\text{ k}\Omega$ ,  $R_2=47\text{ k}\Omega$ )
- BCR116S: Two internally isolated transistors with good matching in one multichip package
- BCR116S: For orientation in reel see package information below



### BCR116/F/L3 BCR116T/W

### BCR116S



| Type     | Marking         | Pin Configuration |      |      |      |      |      | Package  |
|----------|-----------------|-------------------|------|------|------|------|------|----------|
| BCR116   | WG <sub>s</sub> | 1=B               | 2=E  | 3=C  | -    | -    | -    | SOT23    |
| BCR116F  | WG <sub>s</sub> | 1=B               | 2=E  | 3=C  | -    | -    | -    | TSFP-3   |
| BCR116L3 | WG              | 1=B               | 2=E  | 3=C  | -    | -    | -    | TSLP-3-4 |
| BCR116S  | WG <sub>s</sub> | 1=E1              | 2=B1 | 3=C2 | 4=E2 | 5=B2 | 6=C1 | SOT363   |
| BCR116T  | WG              | 1=B               | 2=E  | 3=C  | -    | -    | -    | SC75     |
| BCR116W  | WG <sub>s</sub> | 1=B               | 2=E  | 3=C  | -    | -    | -    | SOT323   |

**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                                                                                                                                                                                                                                                          | $V_{i(rev)}$ | 5                                      |      |
| Collector current                                                                                                                                                                                                                                                              | $I_C$        | 100                                    | mA   |
| Total power dissipation-<br>BCR116, $T_S \leq 102^\circ\text{C}$<br>BCR116F, $T_S \leq 128^\circ\text{C}$<br>BCR116L3, $T_S \leq 135^\circ\text{C}$<br>BCR116S, $T_S \leq 115^\circ\text{C}$<br>BCR116T, $T_S \leq 109^\circ\text{C}$<br>BCR116W, $T_S \leq 124^\circ\text{C}$ | $P_{tot}$    | 200<br>250<br>250<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  |
| BCR116                                   |            | $\leq 240$ |      |
| BCR116F                                  |            | $\leq 90$  |      |
| BCR116L3                                 |            | $\leq 60$  |      |
| BCR116S                                  |            | $\leq 140$ |      |
| BCR116T                                  |            | $\leq 165$ |      |
| BCR116W                                  |            | $\leq 105$ |      |

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

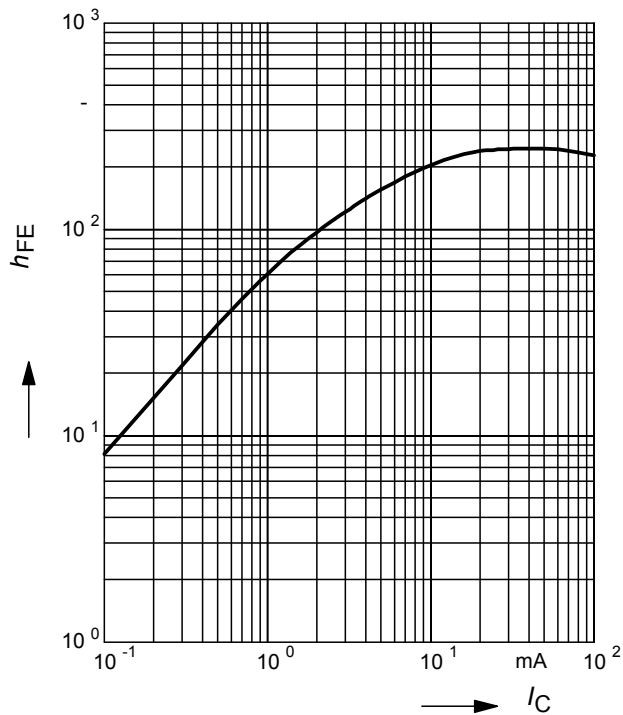
**Electrical Characteristics** at  $T_A = 25^\circ\text{C}$ , unless otherwise specified

| 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>$V_{\text{EB}} = 5\ \text{V}$ , $I_C = 0$                              | $I_{\text{EBO}}$            | -      | -    | 155  | $\mu\text{A}$ |
| 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>$I_C = 100\ \mu\text{A}$ , $V_{\text{CE}} = 5\ \text{V}$                         | $V_{\text{i(off)}}$         | 0.4    | -    | 0.8  |               |
| Input on voltage<br>$I_C = 2\ \text{mA}$ , $V_{\text{CE}} = 0.3\ \text{V}$                            | $V_{\text{i(on)}}$          | 0.5    | -    | 1.4  |               |
| Input resistor                                                                                        | $R_1$                       | 3.2    | 4.7  | 6.2  | k $\Omega$    |
| Resistor ratio                                                                                        | $R_1/R_2$                   | 0.09   | 0.1  | 0.11 | -             |
| AC Characteristics                                                                                    |                             |        |      |      |               |
| Transition frequency<br>$I_C = 10\ \text{mA}$ , $V_{\text{CE}} = 5\ \text{V}$ , $f = 100\ \text{MHz}$ | $f_{\text{T}}$              | -      | 150  | -    | 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:  $t < 300\ \mu\text{s}$ ;  $D < 2\%$

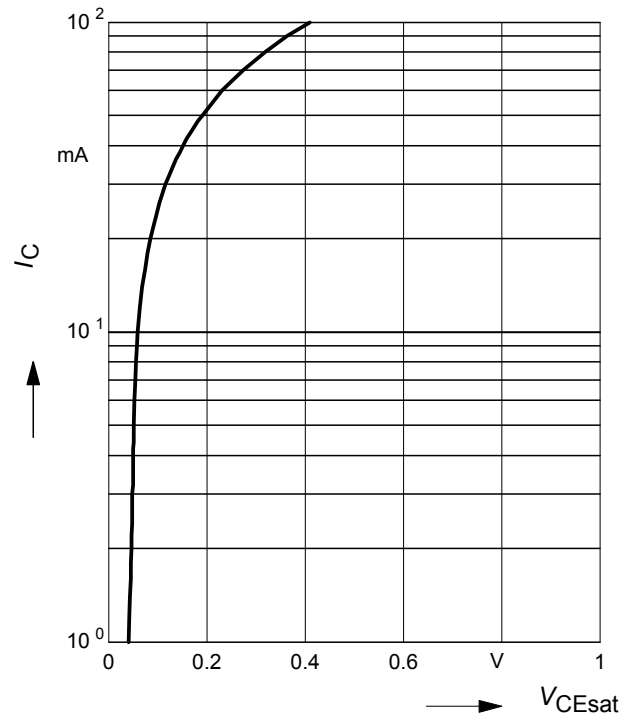
### DC current gain $h_{FE} = f(I_C)$

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



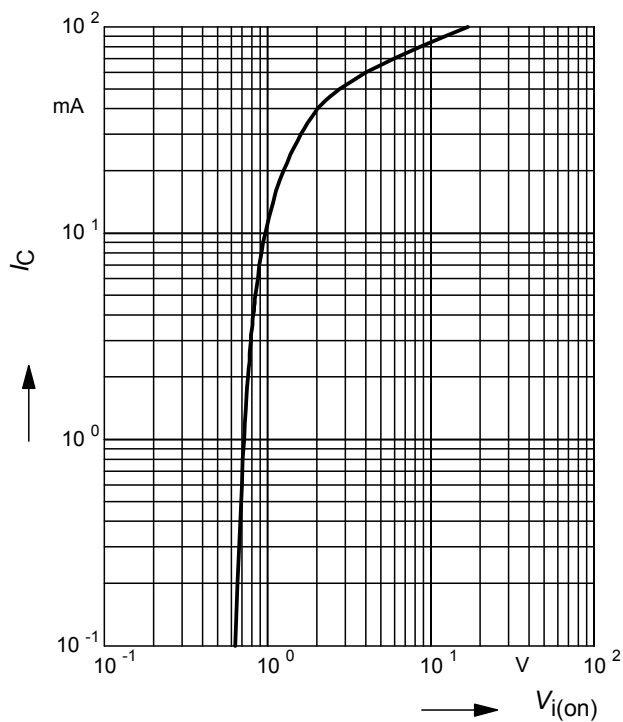
### Collector-emitter saturation voltage

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



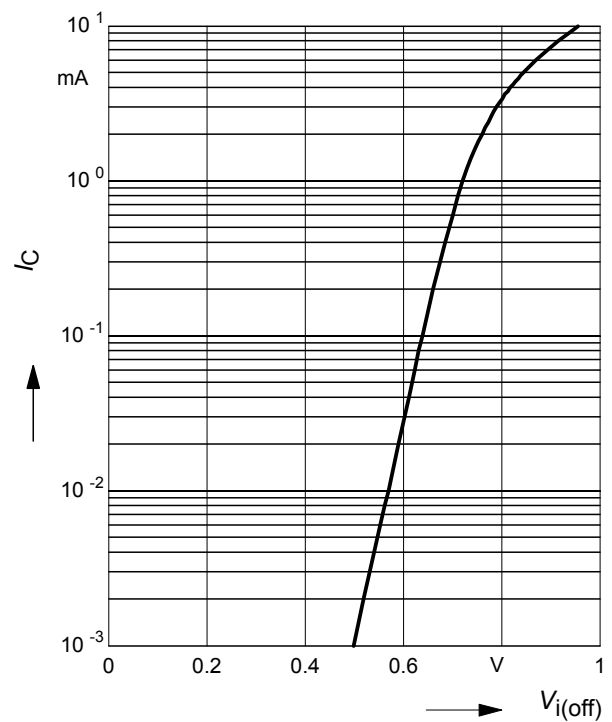
### Input on Voltage $V_{i(on)} = f(I_C)$

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



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

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



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

BCR116



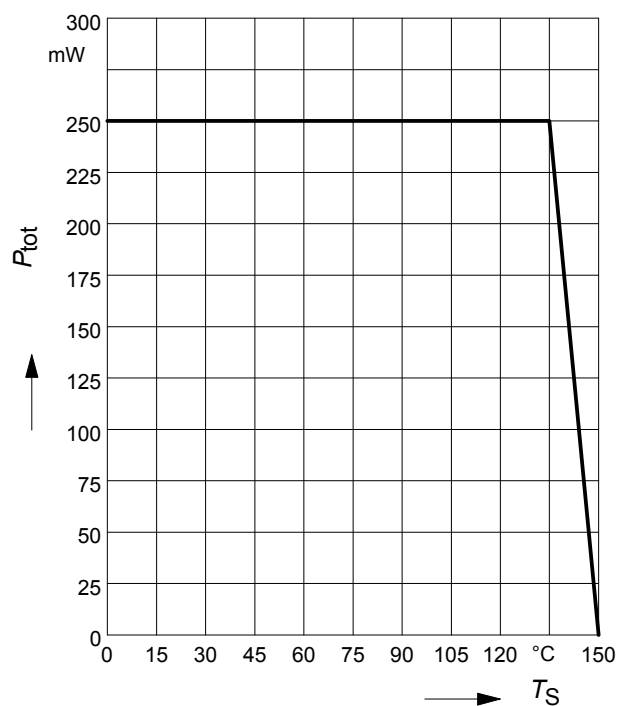
**Total power dissipation  $P_{\text{tot}} = f(T_S)$**

BCR116F



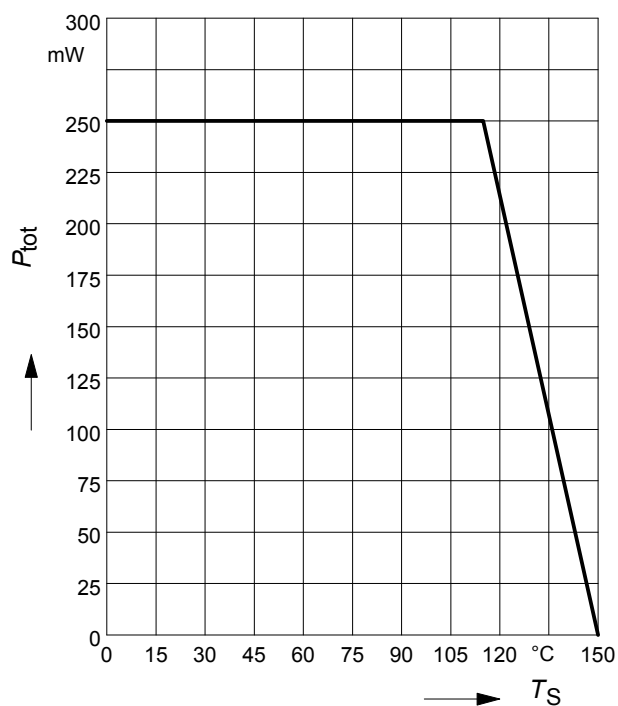
**Total power dissipation  $P_{\text{tot}} = f(T_S)$**

BCR116L3



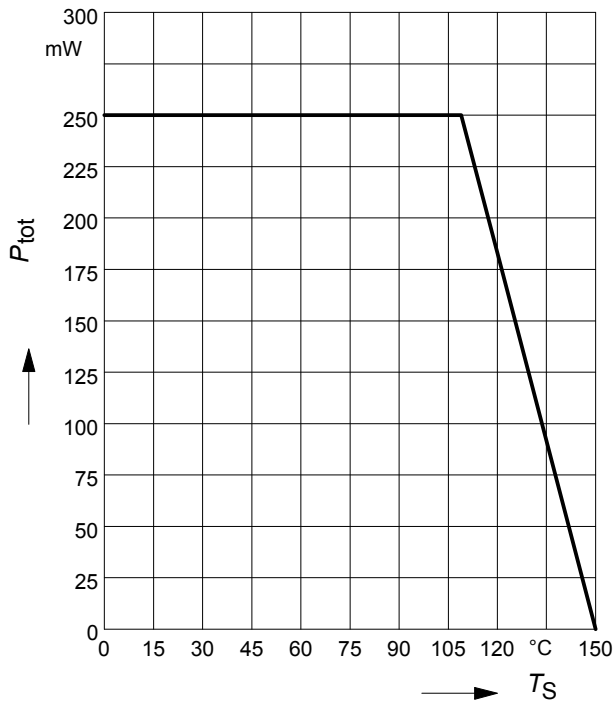
**Total power dissipation  $P_{\text{tot}} = f(T_S)$**

BCR116S



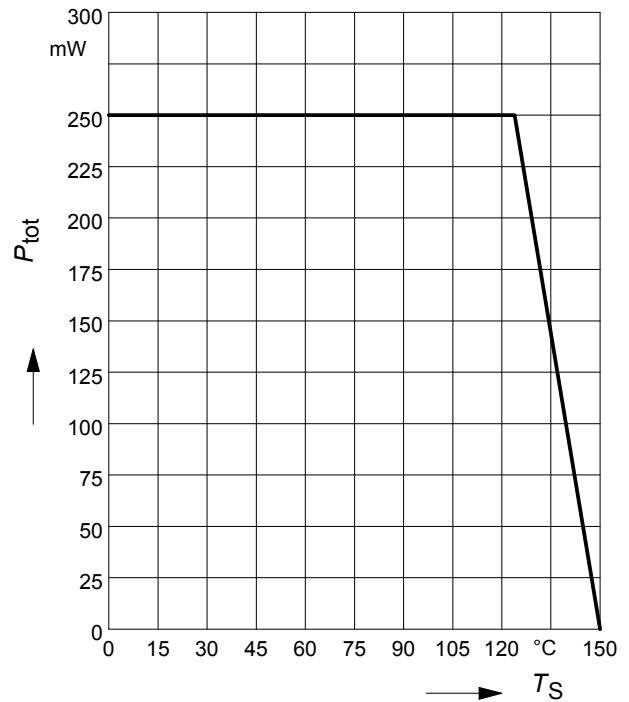
Total power dissipation  $P_{\text{tot}} = f(T_S)$

BCR116T



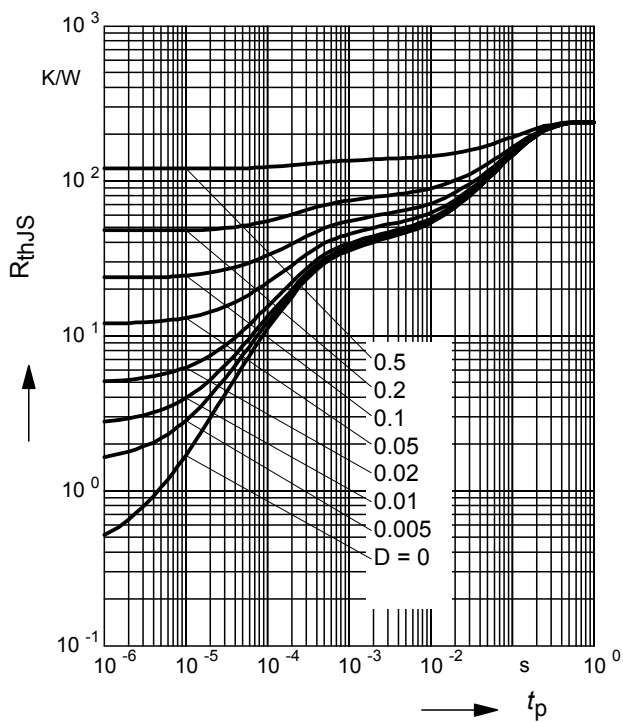
Total power dissipation  $P_{\text{tot}} = f(T_S)$

BCR116W



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

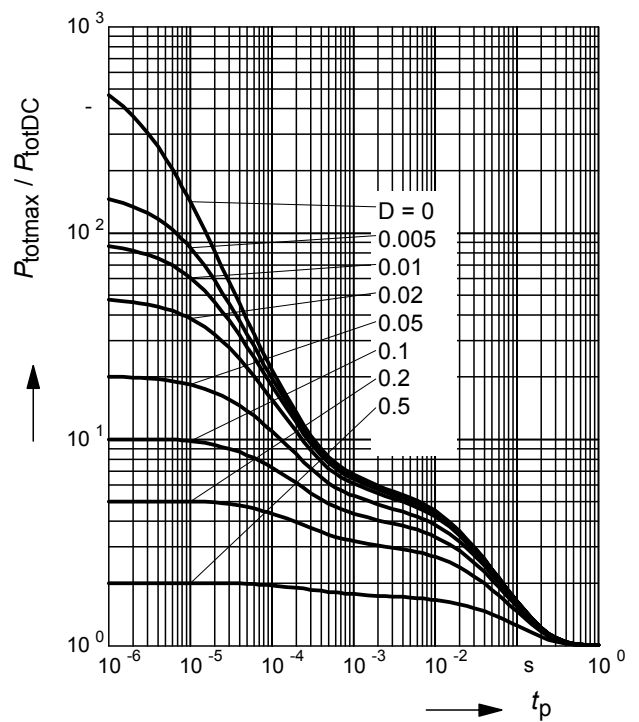
BCR116



Permissible Pulse Load

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

BCR116



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

BCR116F



### Permissible Pulse Load

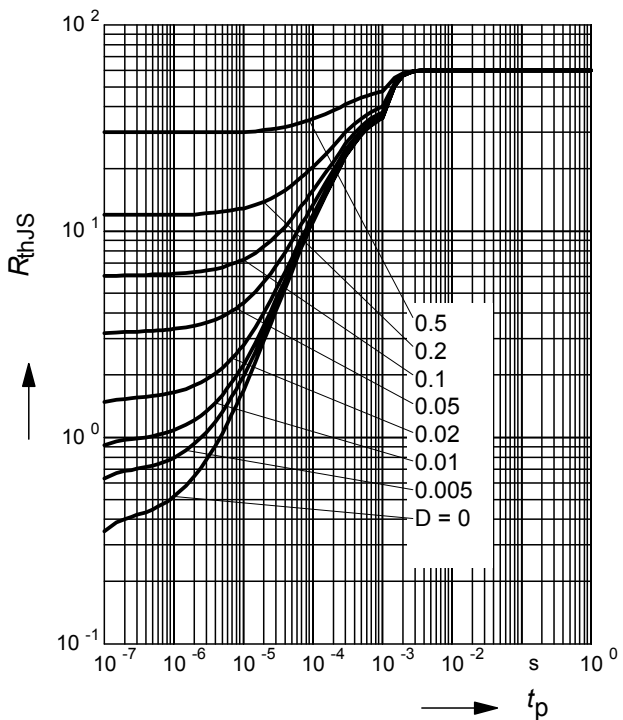
$$P_{totmax}/P_{totDC} = f(t_p)$$

BCR116F



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

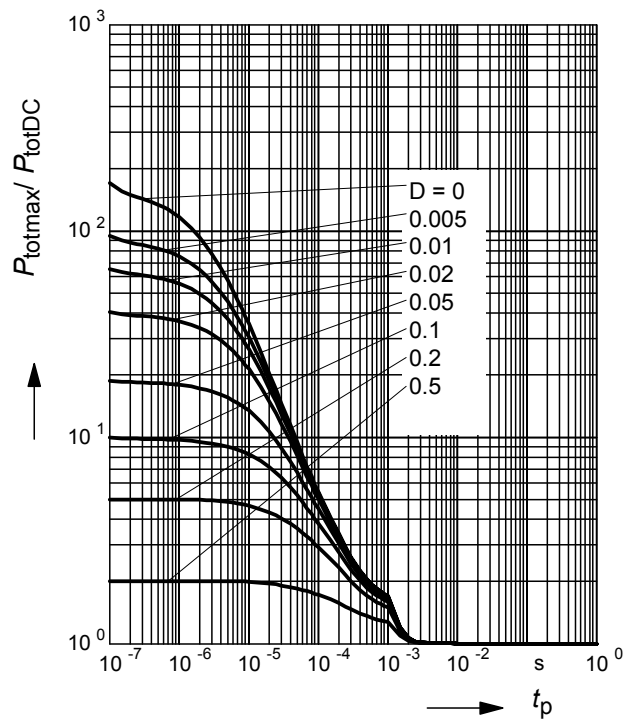
BCR116L3



### Permissible Pulse Load

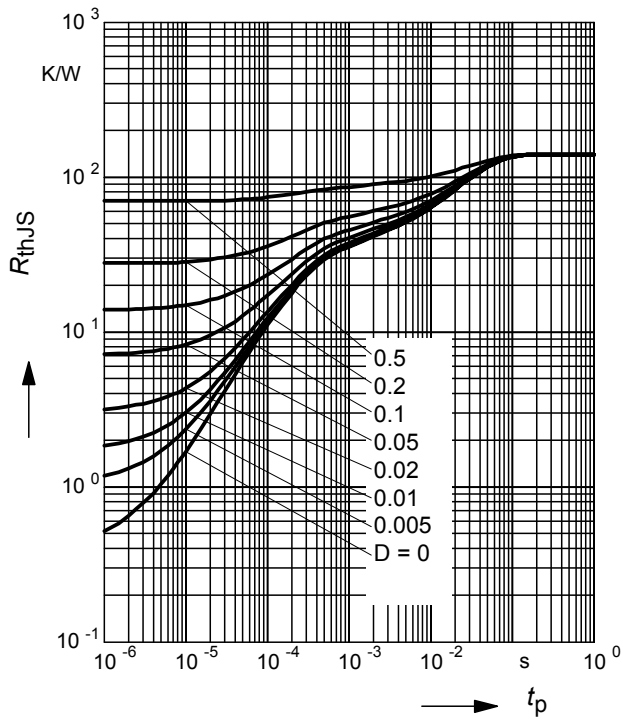
$$P_{totmax}/P_{totDC} = f(t_p)$$

BCR116L3



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

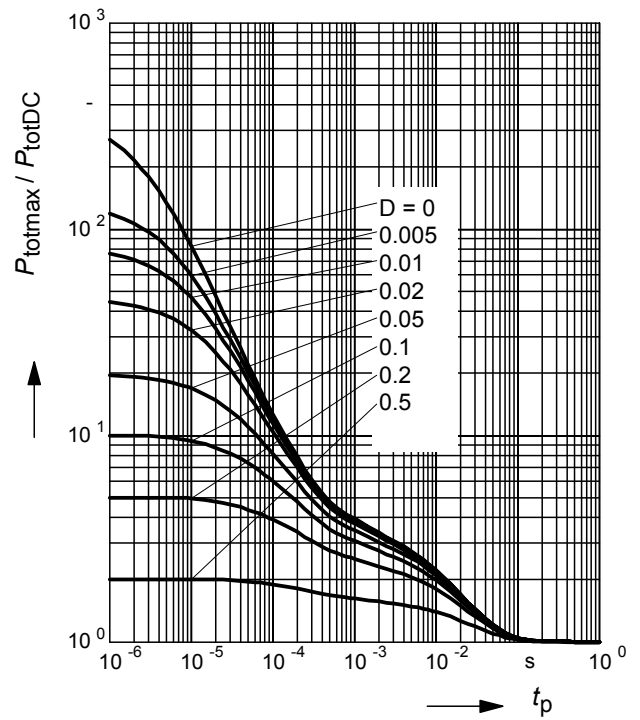
BCR116S



### Permissible Pulse Load

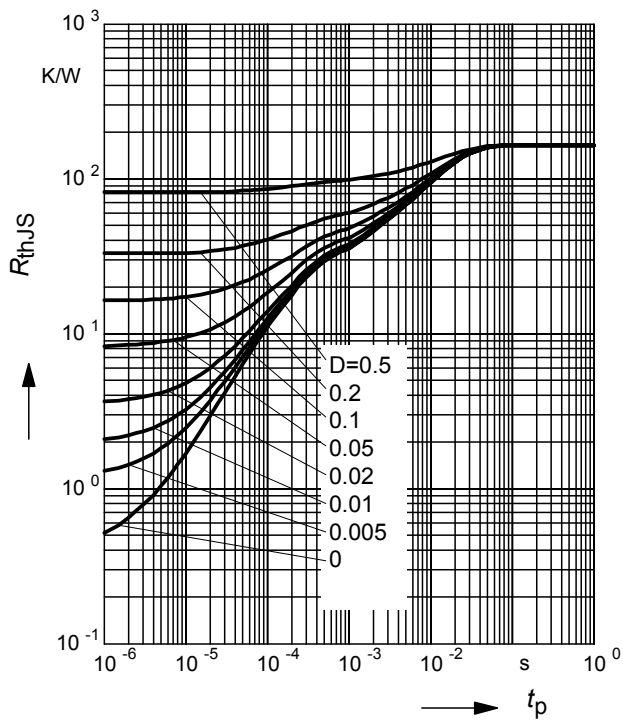
$$P_{totmax}/P_{totDC} = f(t_p)$$

BCR116S



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

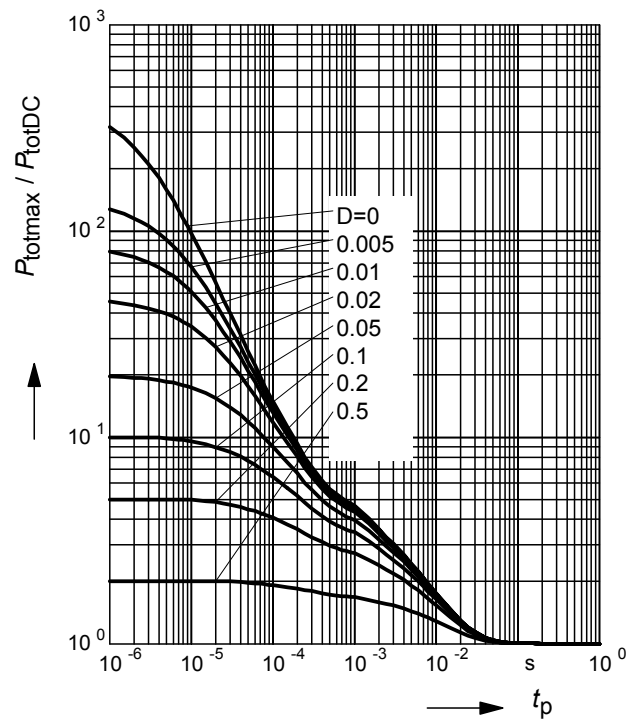
BCR116T



### Permissible Pulse Load

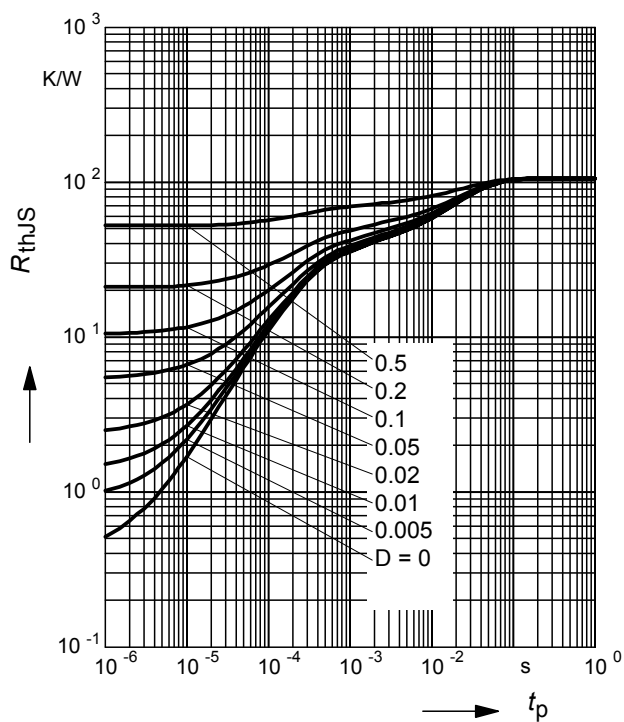
$$P_{totmax}/P_{totDC} = f(t_p)$$

BCR116T



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

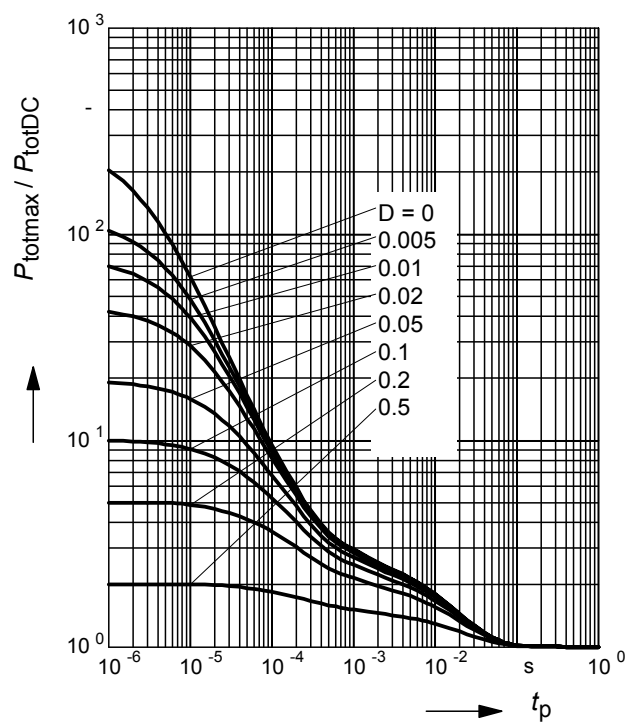
BCR116W



### Permissible Pulse Load

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

BCR116W



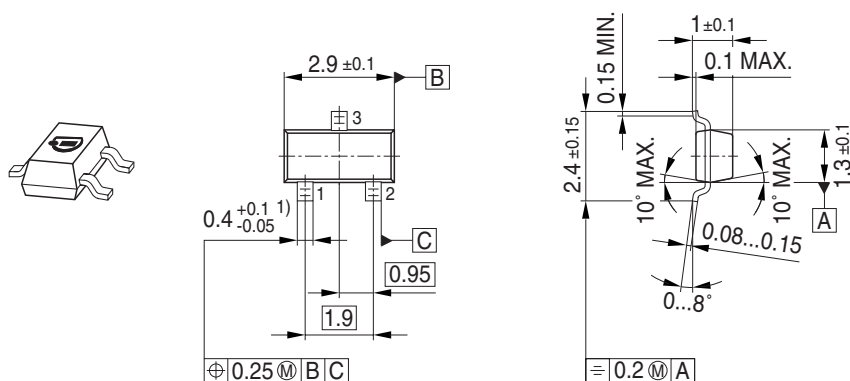


Date Code marking for discrete packages with one digit (SCD80, SC79, SC75<sup>1)</sup>) CES-Code

| Month | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|-------|------|------|------|------|------|------|------|------|------|------|------|------|
| 01    | a    | p    | A    | P    | a    | p    | A    | P    | a    | p    | A    | P    |
| 02    | b    | q    | B    | Q    | b    | q    | B    | Q    | b    | q    | B    | Q    |
| 03    | c    | r    | C    | R    | c    | r    | C    | R    | c    | r    | C    | R    |
| 04    | d    | s    | D    | S    | d    | s    | D    | S    | d    | s    | D    | S    |
| 05    | e    | t    | E    | T    | e    | t    | E    | T    | e    | t    | E    | T    |
| 06    | f    | u    | F    | U    | f    | u    | F    | U    | f    | u    | F    | U    |
| 07    | g    | v    | G    | V    | g    | v    | G    | V    | g    | v    | G    | V    |
| 08    | h    | x    | H    | X    | h    | x    | H    | X    | h    | x    | H    | X    |
| 09    | j    | y    | J    | Y    | j    | y    | J    | Y    | j    | y    | J    | Y    |
| 10    | k    | z    | K    | Z    | k    | z    | K    | Z    | k    | z    | K    | Z    |
| 11    | l    | 2    | L    | 4    | l    | 2    | L    | 4    | l    | 2    | L    | 4    |
| 12    | n    | 3    | N    | 5    | n    | 3    | N    | 5    | n    | 3    | N    | 5    |

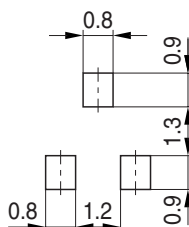
1) New Marking Layout for SC75, implemented at October 2005.

## Package Outline

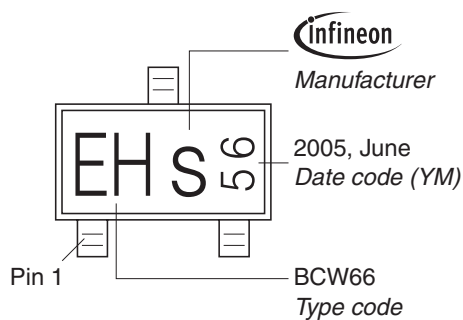


1) Lead width can be 0.6 max. in dambar area

## Foot Print

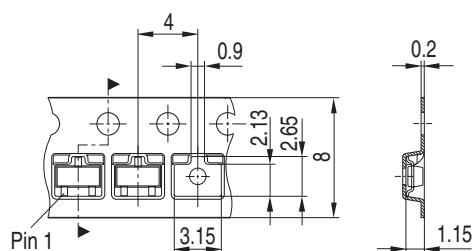


## Marking Layout (Example)

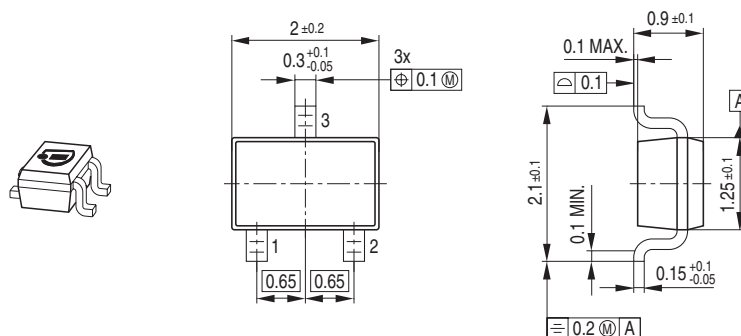


## Standard Packing

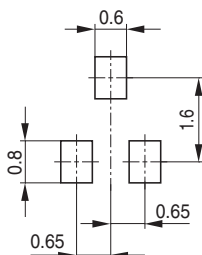
Reel ø180 mm = 3.000 Pieces/Reel  
Reel ø330 mm = 10.000 Pieces/Reel



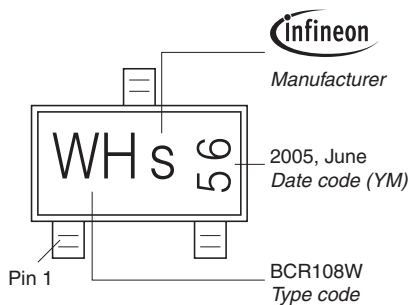
## Package Outline



## Foot Print

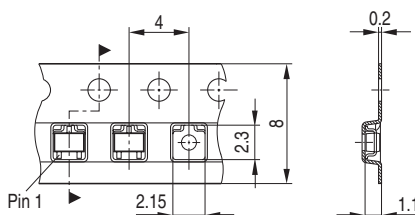


## Marking Layout (Example)

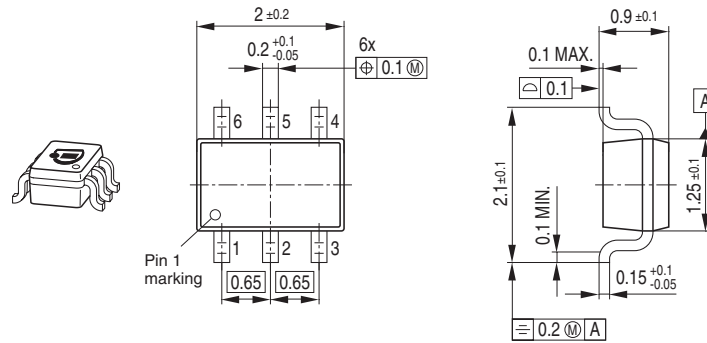


## Standard Packing

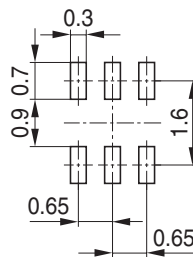
Reel  $\varnothing 180$  mm = 3.000 Pieces/Reel  
 Reel  $\varnothing 330$  mm = 10.000 Pieces/Reel



## Package Outline

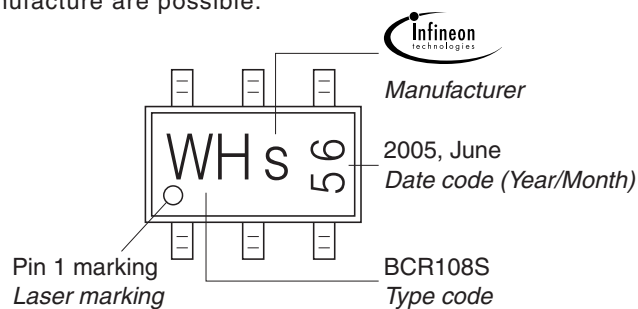


## Foot Print



## Marking Layout (Example)

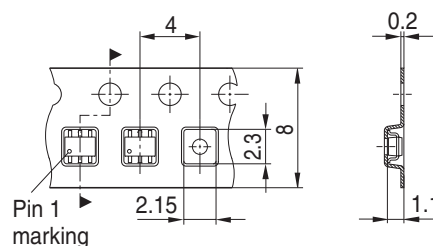
Small variations in positioning of Date code, Type code and Manufacture are possible.



## Standard Packing

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

For symmetric types no defined Pin 1 orientation in reel.



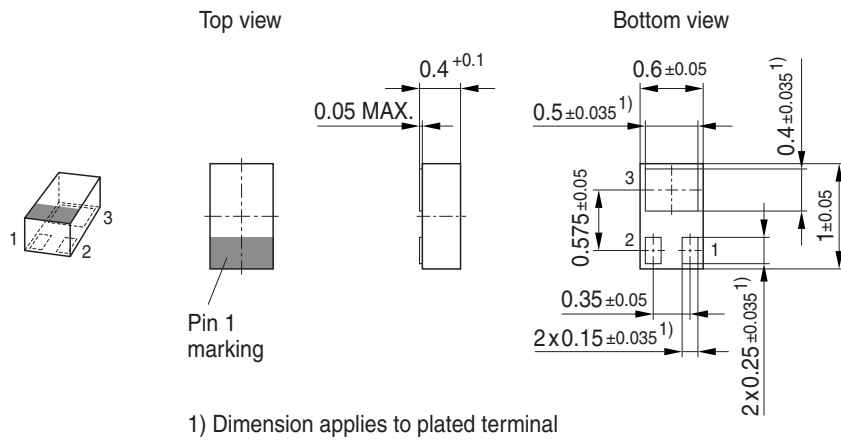
Technical drawing of a mechanical part. The drawing shows a top view and a side view. The top view is a rectangle with a width of 0.4 and a height of 0.45. The side view is a rectangle with a width of 0.4 and a height of 1.05. The drawing is labeled with dimensions: 0.4, 0.45, 1.05, and 0.4.

Diagram illustrating the marking on the BCR847BF diode:

- Manufacturer:** infineon
- Pin 1:** Indicated by a line pointing to the first pin.
- Type code:** BCR847BF

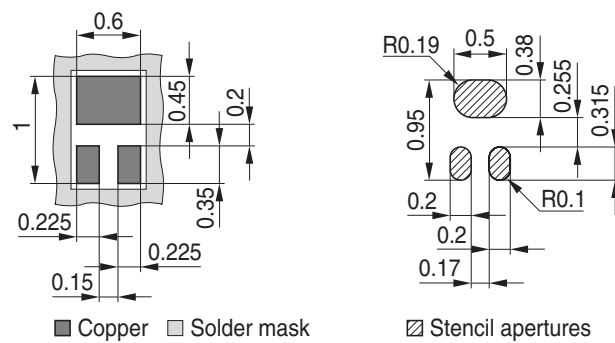
Technical drawing of a mechanical part with dimensions. The drawing shows a side view and a cross-section. Dimensions include: 4, 0.3, 1.2, 1.5, 8, 0.2, 0.7, 1.35, and Pin 1.

## Package Outline

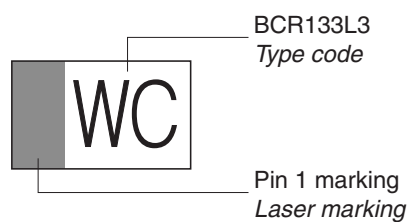


## Foot Print

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

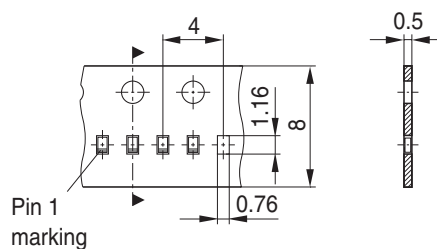


## Marking Layout



## Standard Packing

Reel ø180 mm = 15.000 Pieces/Reel



Edition 2006-02-01

Published by

Infineon Technologies AG

81726 München, Germany

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