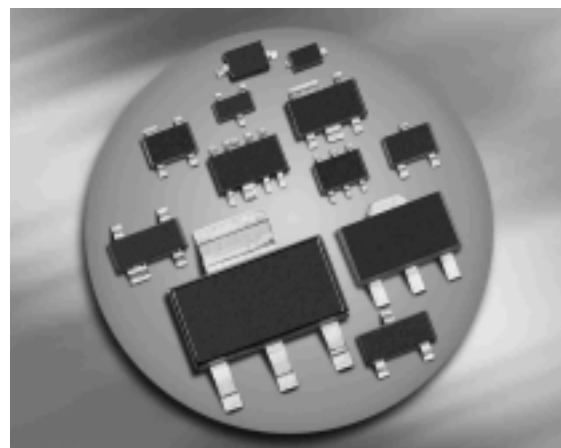
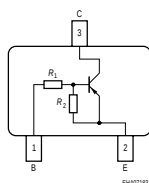


**PNP Silicon Digital Transistor**

- Switching circuit, inverter, interface circuit, driver circuit
- Built in bias resistor ( $R_1 = 47k\Omega$  ,  $R_2 = 22k\Omega$  )


**BCR196/F/L3**  
**BCR196T/W**


| Type     | Marking | Pin Configuration |     |     |   |   |   | Package  |
|----------|---------|-------------------|-----|-----|---|---|---|----------|
| BCR196   | WXs     | 1=B               | 2=E | 3=C | - | - | - | SOT23    |
| BCR196F  | WXs     | 1=B               | 2=E | 3=C | - | - | - | TSFP-3   |
| BCR196L3 | WX      | 1=B               | 2=E | 3=C | - | - | - | TSLP-3-4 |
| BCR196T  | WX      | 1=B               | 2=E | 3=C | - | - | - | SC75     |
| BCR196W  | WXs     | 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                                                                                                                                                                                                                 | $V_{i(fwd)}$ | 80                              |                  |
| Input reverse voltage                                                                                                                                                                                                                 | $V_{i(rev)}$ | 10                              |                  |
| Collector current                                                                                                                                                                                                                     | $I_C$        | 70                              | mA               |
| Total power dissipation-<br>BCR196, $T_S \leq 102^\circ\text{C}$<br>BCR196F, $T_S \leq 128^\circ\text{C}$<br>BCR196L3, $T_S \leq 135^\circ\text{C}$<br>BCR196T, $T_S \leq 109^\circ\text{C}$<br>BCR196W, $T_S \leq 124^\circ\text{C}$ | $P_{tot}$    | 200<br>250<br>250<br>250<br>250 | mW               |
| Junction temperature                                                                                                                                                                                                                  | $T_j$        | 150                             | $^\circ\text{C}$ |
| Storage temperature                                                                                                                                                                                                                   | $T_{stg}$    | 150 ... -65                     |                  |

**Thermal Resistance**

| Parameter                                                                                       | Symbol     | Value                                                            | Unit |
|-------------------------------------------------------------------------------------------------|------------|------------------------------------------------------------------|------|
| Junction - soldering point <sup>1)</sup><br>BCR196<br>BCR196F<br>BCR196L3<br>BCR196T<br>BCR196W | $R_{thJS}$ | $\leq 240$<br>$\leq 90$<br>$\leq 60$<br>$\leq 165$<br>$\leq 105$ | K/W  |

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

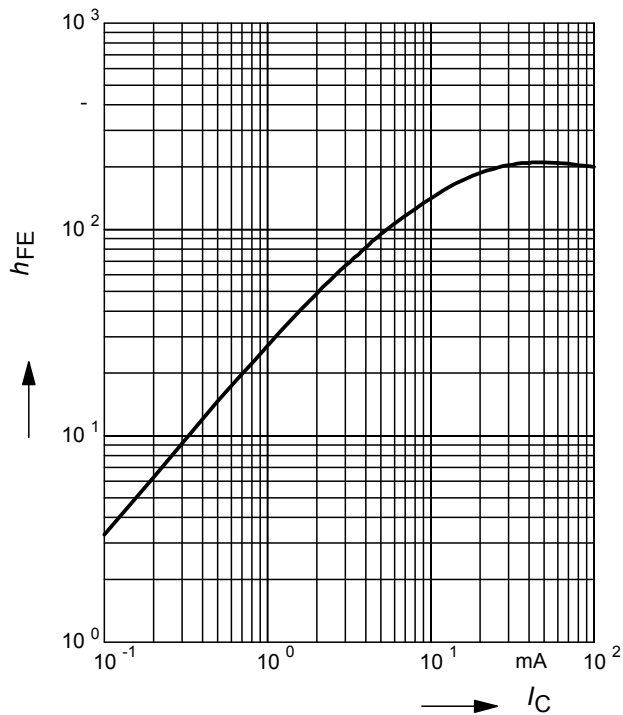
**Electrical Characteristics** at  $T_A = 25^\circ\text{C}$ , unless otherwise specified

| 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>$V_{\text{EB}} = 10\ \text{V}$ , $I_C = 0$                             | $I_{\text{EBO}}$            | -      | -    | 220  | $\mu\text{A}$ |
| DC current gain <sup>1)</sup><br>$I_C = 5\ \text{mA}$ , $V_{\text{CE}} = 5\ \text{V}$                 | $h_{\text{FE}}$             | 50     | -    | -    | -             |
| 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>$I_C = 100\ \mu\text{A}$ , $V_{\text{CE}} = 5\ \text{V}$                         | $V_{\text{i(off)}}$         | 1,2    | -    | 2,6  |               |
| Input on voltage<br>$I_C = 2\ \text{mA}$ , $V_{\text{CE}} = 0,3\ \text{V}$                            | $V_{\text{i(on)}}$          | 1,5    | -    | 4    |               |
| Input resistor                                                                                        | $R_1$                       | 32     | 47   | 62   | kΩ            |
| Resistor ratio                                                                                        | $R_1/R_2$                   | 1,92   | 2,14 | 2,36 | -             |
| 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:  $t < 300\ \mu\text{s}$ ;  $D < 2\%$

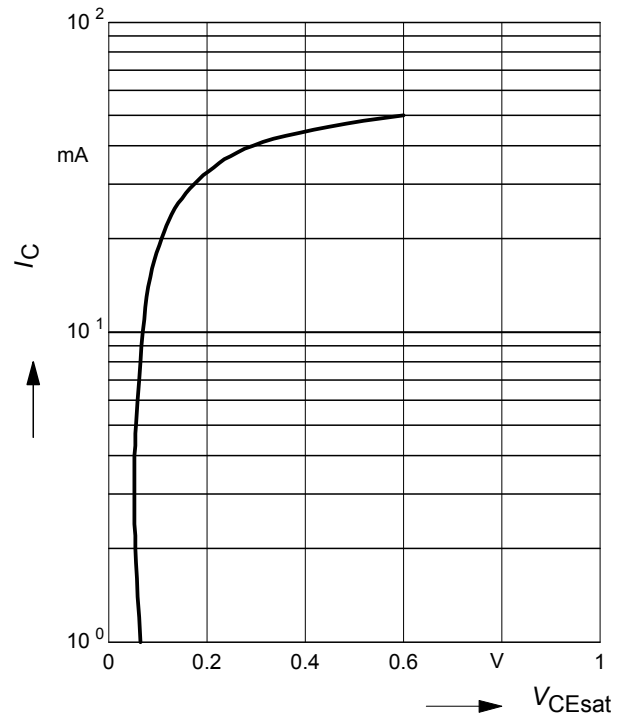
**DC current gain  $h_{FE} = f(I_C)$**

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



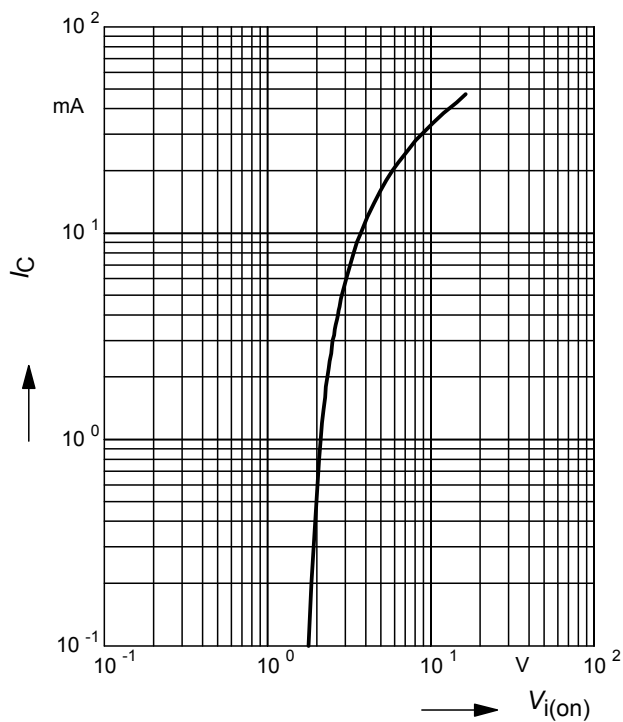
**Collector-emitter saturation voltage**

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



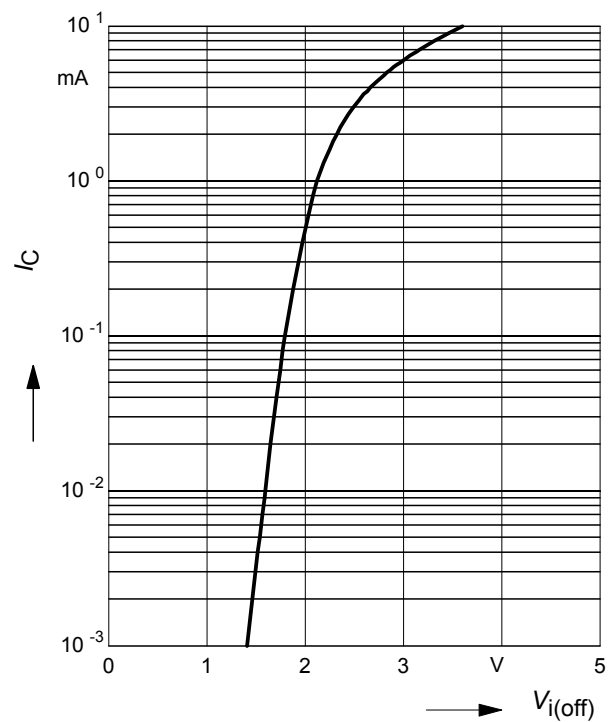
**Input on Voltage  $V_{i(on)} = f(I_C)$**

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



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

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



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

BCR196



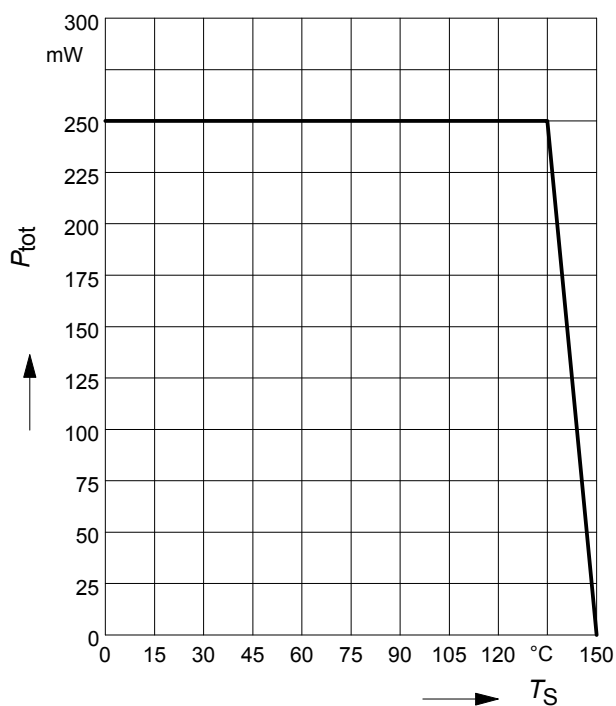
**Total power dissipation  $P_{\text{tot}} = f(T_S)$**

BCR196F



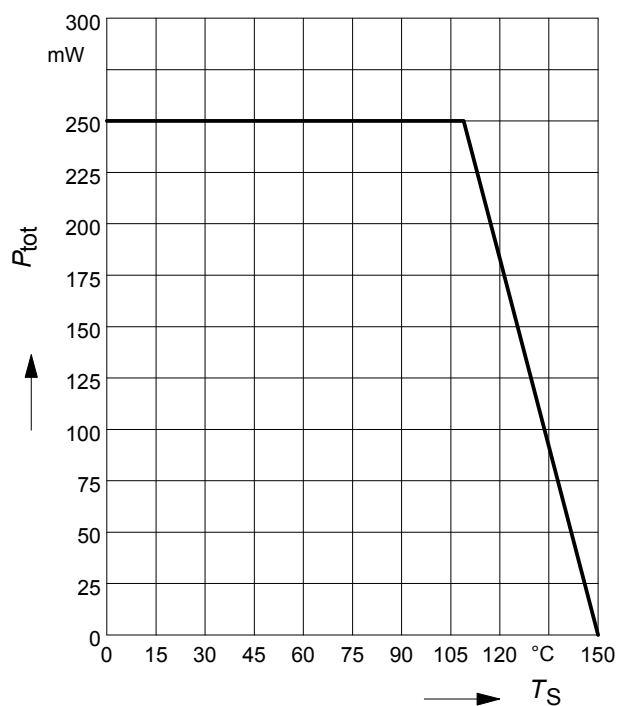
**Total power dissipation  $P_{\text{tot}} = f(T_S)$**

BCR196L3



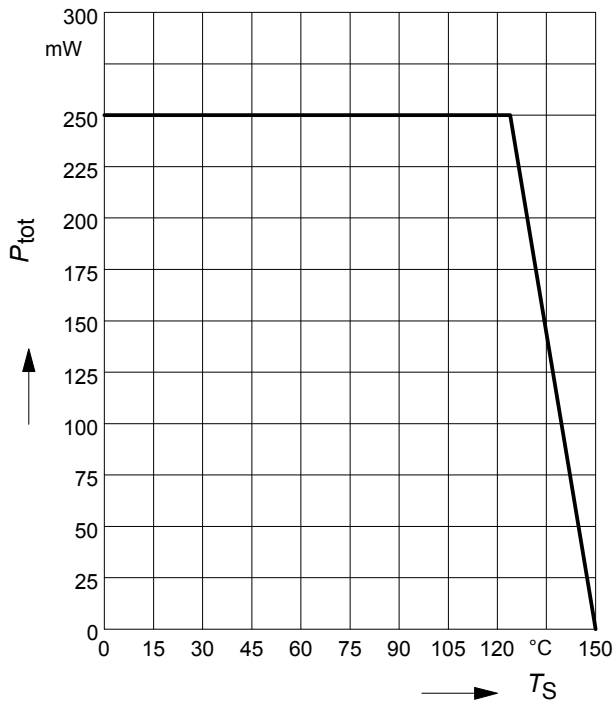
**Total power dissipation  $P_{\text{tot}} = f(T_S)$**

BCR196T



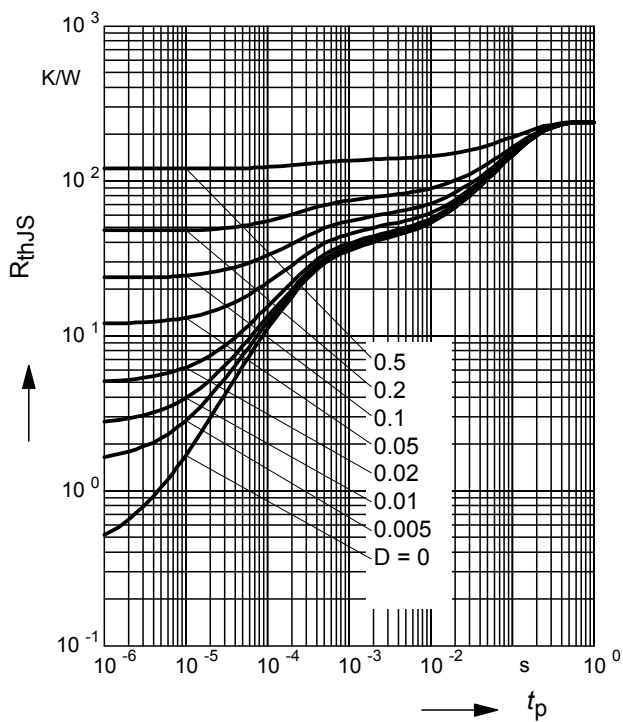
**Total power dissipation**  $P_{\text{tot}} = f(T_S)$

BCR196W



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

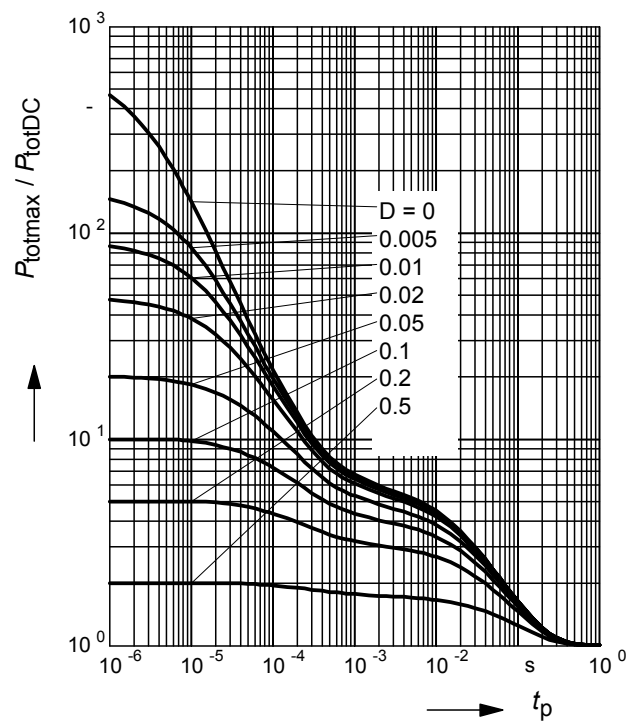
BCR196



**Permissible Pulse Load**

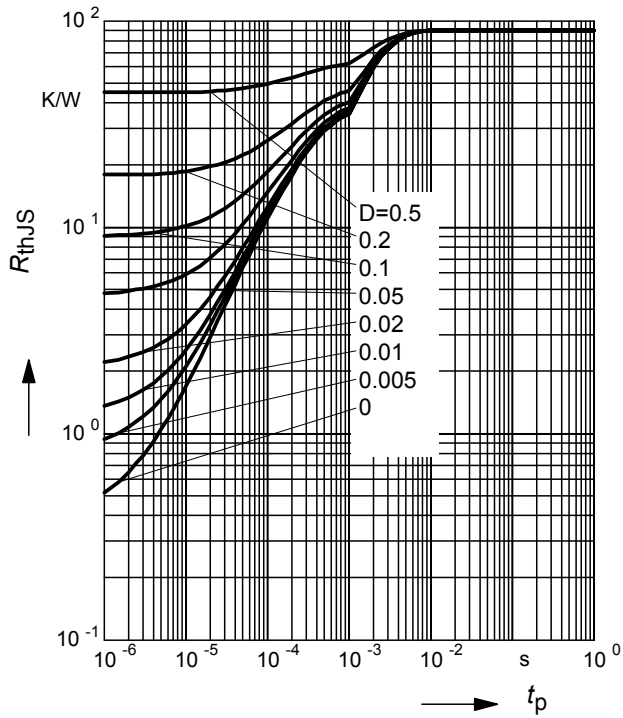
$P_{\text{totmax}}/P_{\text{totDC}} = f(t_p)$

BCR196



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

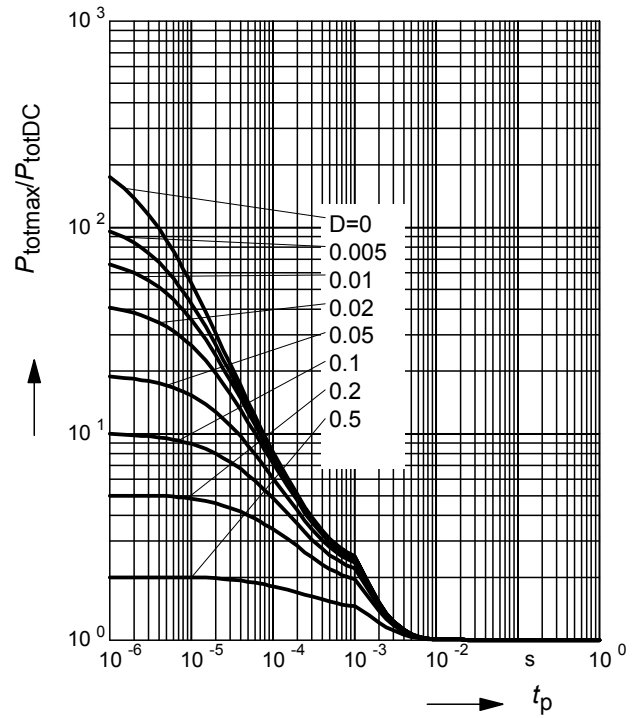
BCR196F



### Permissible Pulse Load

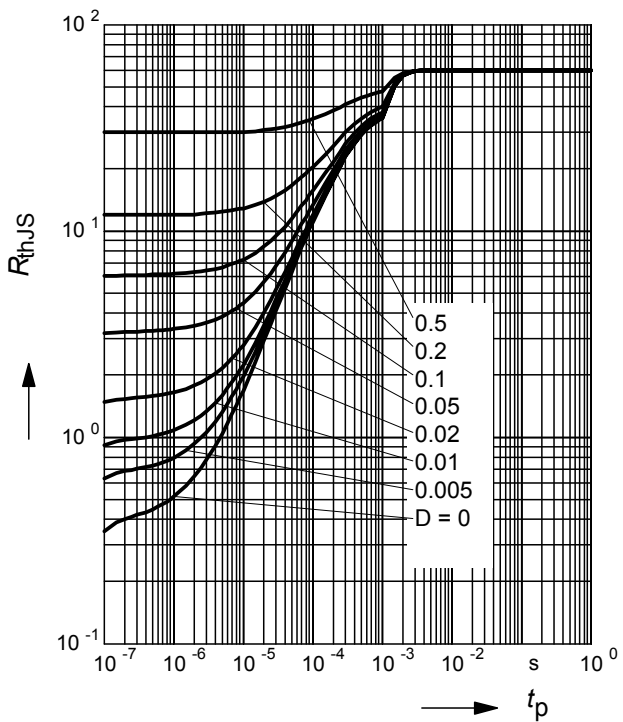
$$P_{totmax}/P_{totDC} = f(t_p)$$

BCR196F



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

BCR196L3



### Permissible Pulse Load

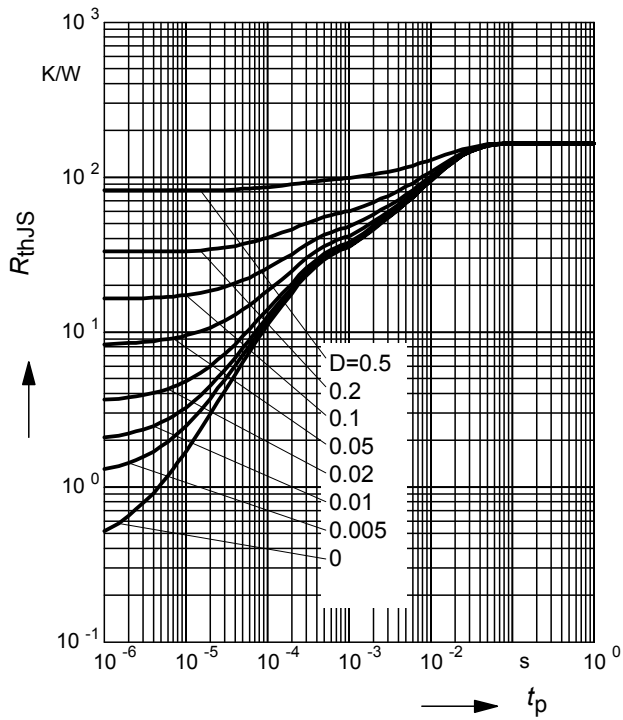
$$P_{totmax}/P_{totDC} = f(t_p)$$

BCR196L3



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

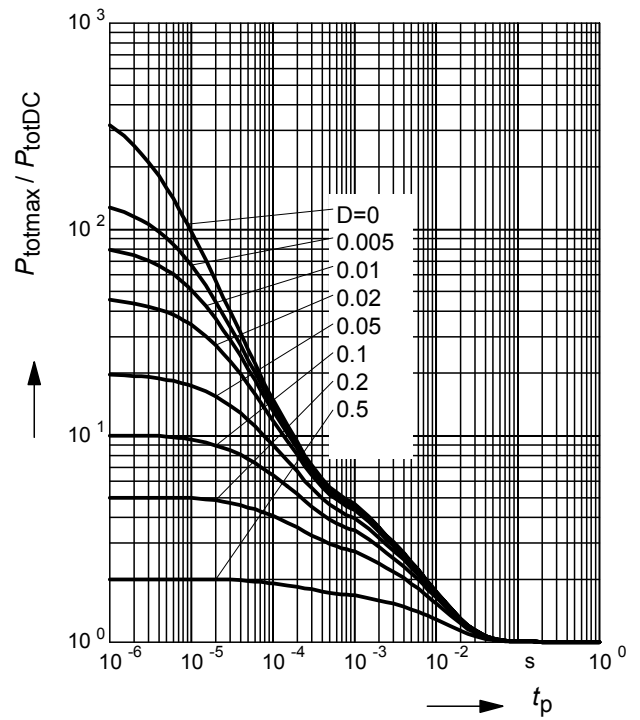
BCR196T



### Permissible Pulse Load

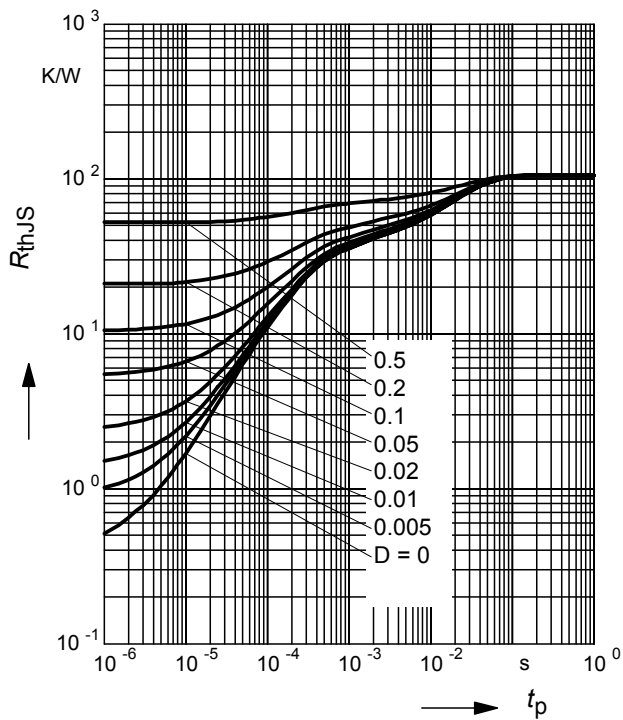
$$P_{totmax}/P_{totDC} = f(t_p)$$

BCR196T



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

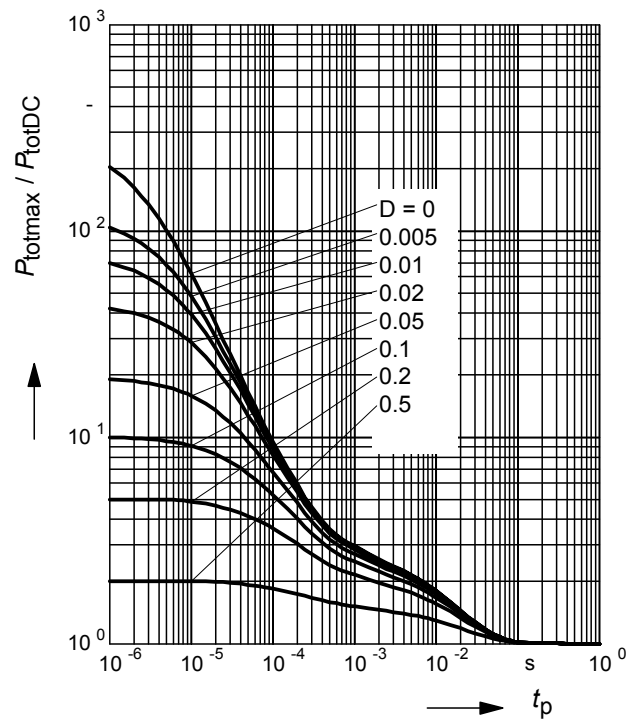
BCR196W



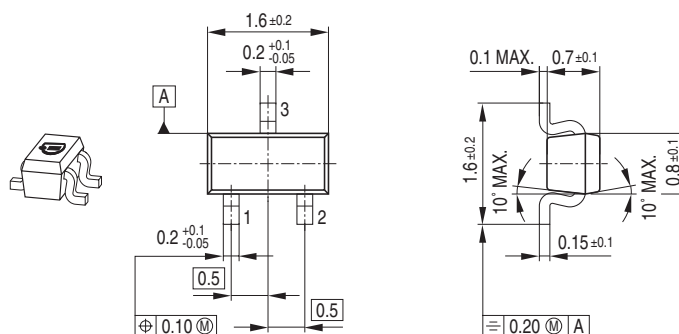
### Permissible Pulse Load

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

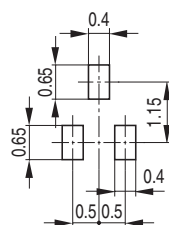
BCR196W



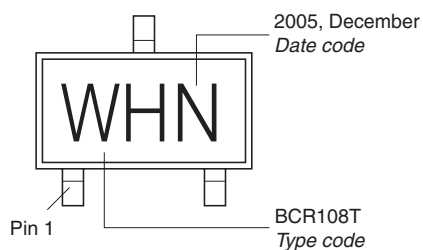
## Package Outline



## Foot Print

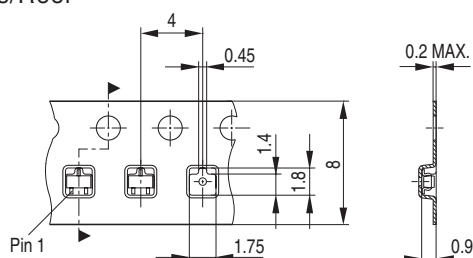


## Marking Layout (Example)



## Standard Packing

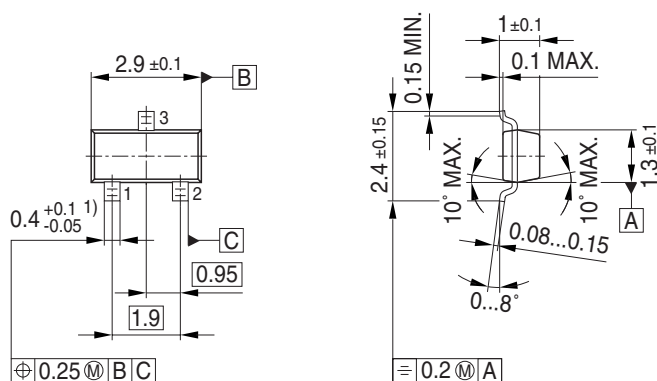
Reel ø180 mm = 3.000 Pieces/Reel  
Reel ø330 mm = 10.000 Pieces/Reel



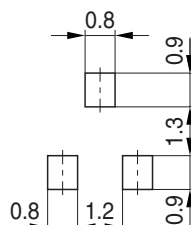
Date Code marking for discrete packages with one digit (SCD80, SC79, SC75<sup>1)</sup>) CES-Code

| 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.



## Foot Print



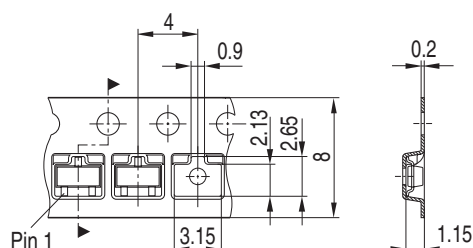
Infineon  
Manufacturer

2005, June  
Date code (YM)

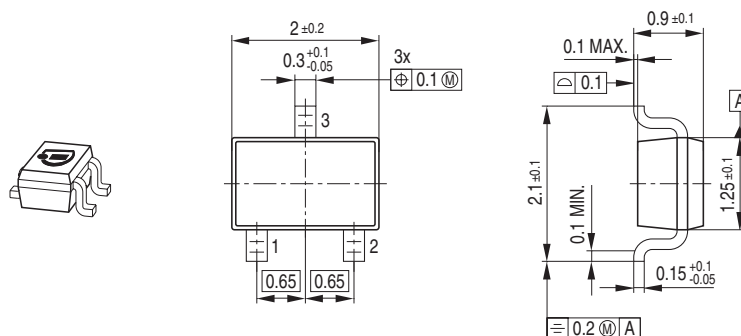
Pin 1

BCW66  
Type code

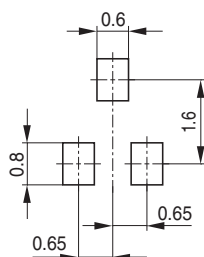
Reel ø180 mm = 3.000 Pieces/Reel  
Reel ø330 mm = 10.000 Pieces/Reel



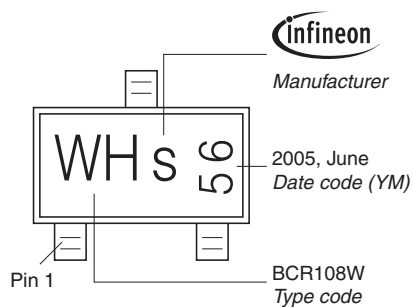
## Package Outline



## Foot Print

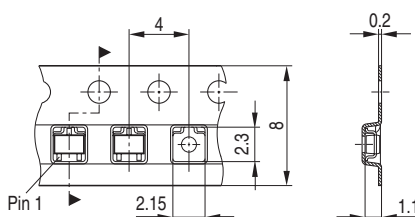


## Marking Layout (Example)

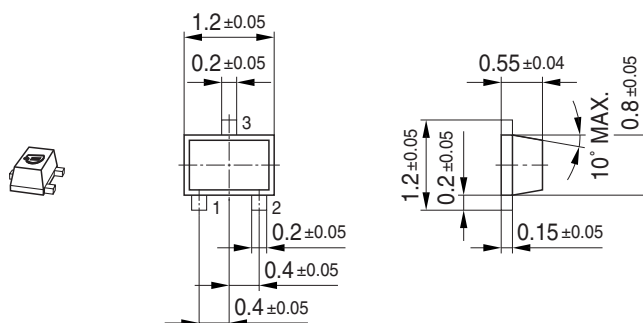


## Standard Packing

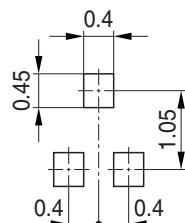
Reel  $\varnothing 180$  mm = 3.000 Pieces/Reel  
 Reel  $\varnothing 330$  mm = 10.000 Pieces/Reel



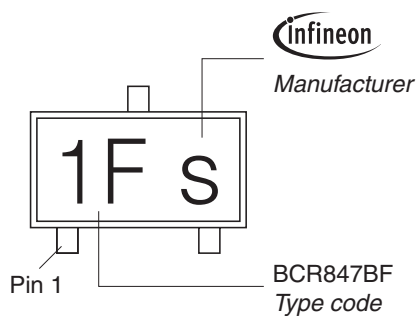
## Package Outline



## Foot Print

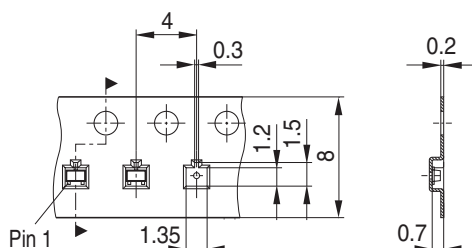


## Marking Layout (Example)

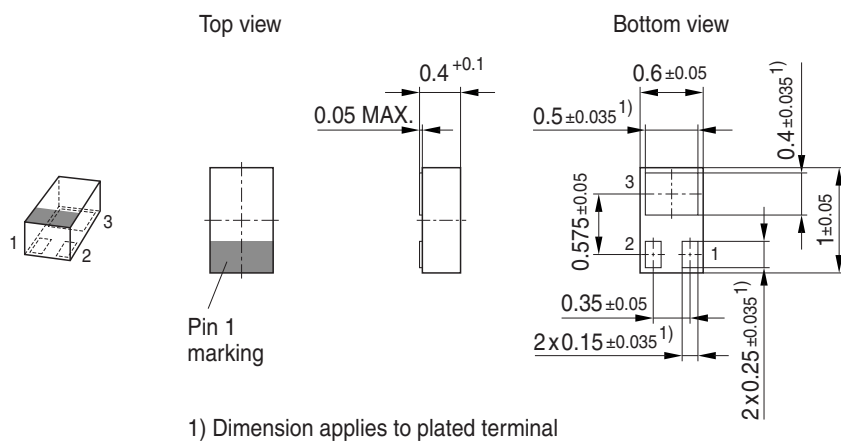


## Standard Packing

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

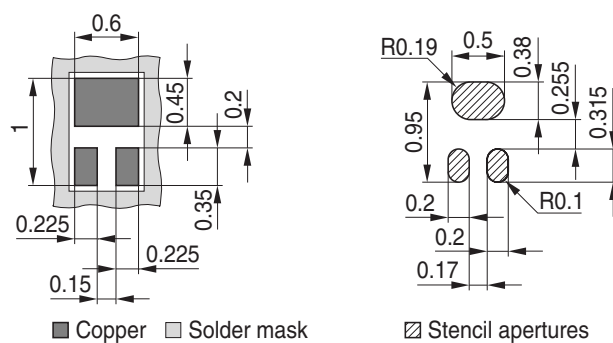


## Package Outline

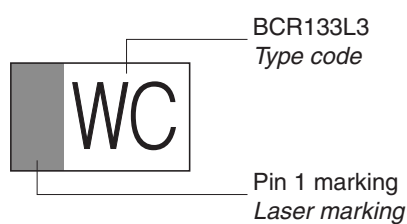


## Foot Print

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

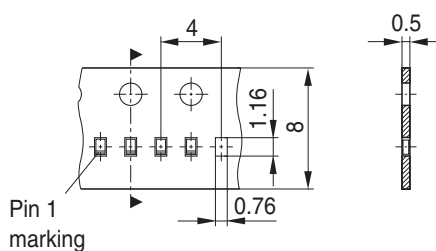


## Marking Layout



## Standard Packing

Reel ø180 mm = 15.000 Pieces/Reel



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