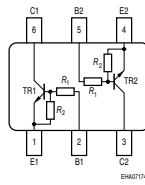
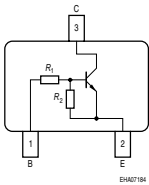


**NPN Silicon Digital Transistor**

- Switching circuit, inverter, interface circuit driver circuit
- Built in bias resistor ( $R_1=47\text{ k}\Omega$ ,  $R_2=47\text{ k}\Omega$ )
- BCR148S / U: Two internally isolated transistors with good matching in one multichip package
- BCR148S / U: For orientation in reel see package information below


**BCR148/F/L3  
BCR148T/W**
**BCR148S/U**


| Type     | Marking | Pin Configuration |      |      |      |      |      | Package  |
|----------|---------|-------------------|------|------|------|------|------|----------|
|          |         | 1=B               | 2=E  | 3=C  | -    | -    | -    |          |
| BCR148   | WEs     | 1=B               | 2=E  | 3=C  | -    | -    | -    | SOT23    |
| BCR148F  | WEs     | 1=B               | 2=E  | 3=C  | -    | -    | -    | TSFP-3   |
| BCR148L3 | WE      | 1=B               | 2=E  | 3=C  | -    | -    | -    | TSLP-3-4 |
| BCR148S  | WEs     | 1=E1              | 2=B1 | 3=C2 | 4=E2 | 5=B2 | 6=C1 | SOT363   |
| BCR148T  | WE      | 1=B               | 2=E  | 3=C  | -    | -    | -    | SC75     |
| BCR148U  | WEs     | 1=E1              | 2=B1 | 3=C2 | 4=E2 | 5=B2 | 6=C1 | SC74     |
| BCR148W  | WEs     | 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>BCR148, $T_S \leq 102^\circ\text{C}$<br>BCR148F, $T_S \leq 128^\circ\text{C}$<br>BCR148L3, $T_S \leq 135^\circ\text{C}$<br>BCR148S, $T_S \leq 115^\circ\text{C}$<br>BCR148T, $T_S \leq 109^\circ\text{C}$<br>BCR148U, $T_S \leq 118^\circ\text{C}$<br>BCR148W, $T_S \leq 124^\circ\text{C}$ | $P_{tot}$    | 200<br>250<br>250<br>250<br>250<br>250<br>250 | mW   |
| Junction temperature  | $T_j$        | 150   | °C   |
| Storage temperature   | $T_{stg}$    | -65 ... 150                                   |      |

**Thermal Resistance**

| Parameter                                | Symbol     | Value      | Unit |
|--|------------|------------|------|
| Junction - soldering point <sup>1)</sup> | $R_{thJS}$ |            | K/W  |
| BCR148                                   |            | $\leq 240$ |      |
| BCR148F                                  |            | $\leq 90$  |      |
| BCR148L3                                 |            | $\leq 60$  |      |
| BCR148S                                  |            | $\leq 140$ |      |
| BCR148T                                  |            | $\leq 165$ |      |
| BCR148U                                  |            | $\leq 133$ |      |
| BCR148W                                  |            | $\leq 105$ |      |

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

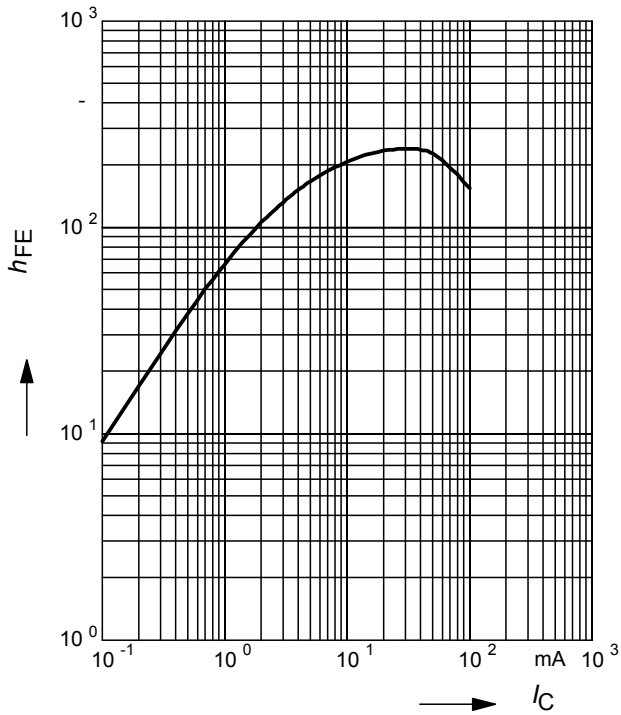
**Electrical Characteristics at  $T_A = 25^\circ\text{C}$ , unless otherwise specified**

| Parameter   | Symbol        | Values |      |      | Unit             |
|---|---------------|--------|------|------|------------------|
|   |               | min.   | typ. | max. |                  |
| <b>DC Characteristics</b>   |               |        |      |      |                  |
| Collector-emitter breakdown voltage<br>$I_C = 100 \mu\text{A}, I_B = 0$                           | $V_{(BR)CEO}$ | 50     | -    | -    | V                |
| Collector-base breakdown voltage<br>$I_C = 10 \mu\text{A}, I_E = 0$                               | $V_{(BR)CBO}$ | 50     | -    | -    |                  |
| Collector-base cutoff current<br>$V_{CB} = 40 \text{ V}, I_E = 0$                                 | $I_{CBO}$     | -      | -    | 100  | nA               |
| Emitter-base cutoff current<br>$V_{EB} = 10 \text{ V}, I_C = 0$                                   | $I_{EBO}$     | -      | -    | 164  | $\mu\text{A}$    |
| DC current gain <sup>1)</sup><br>$I_C = 5 \text{ mA}, V_{CE} = 5 \text{ V}$                       | $h_{FE}$      | 70     | -    | -    | -                |
| Collector-emitter saturation voltage <sup>1)</sup><br>$I_C = 10 \text{ mA}, I_B = 0.5 \text{ mA}$ | $V_{CEsat}$   | -      | -    | 0.3  | V                |
| Input off voltage<br>$I_C = 100 \mu\text{A}, V_{CE} = 5 \text{ V}$                                | $V_{i(off)}$  | 0.8    | -    | 1.5  |                  |
| Input on voltage<br>$I_C = 2 \text{ mA}, V_{CE} = 0.3 \text{ V}$                                  | $V_{i(on)}$   | 1      | -    | 3    |                  |
| Input resistor  | $R_1$         | 32     | 47   | 62   | $\text{k}\Omega$ |
| Resistor ratio  | $R_1/R_2$     | 0.9    | 1    | 1.1  | -                |
| <b>AC Characteristics</b>   |               |        |      |      |                  |
| Transition frequency<br>$I_C = 10 \text{ mA}, V_{CE} = 5 \text{ V}, f = 100 \text{ MHz}$          | $f_T$         | -      | 100  | -    | MHz              |
| Collector-base capacitance<br>$V_{CB} = 10 \text{ V}, f = 1 \text{ MHz}$                          | $C_{cb}$      | -      | 3    | -    | pF               |

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

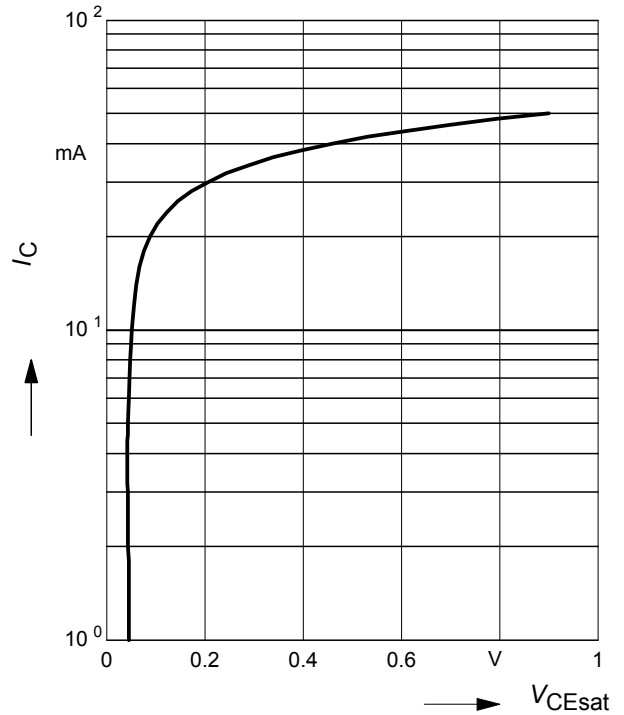
**DC current gain  $h_{FE} = f(I_C)$**

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



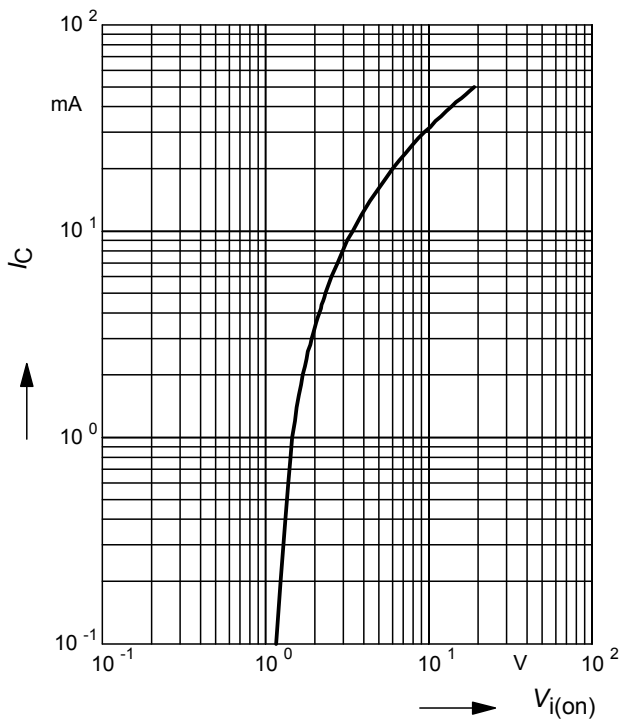
**Collector-emitter saturation voltage**

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



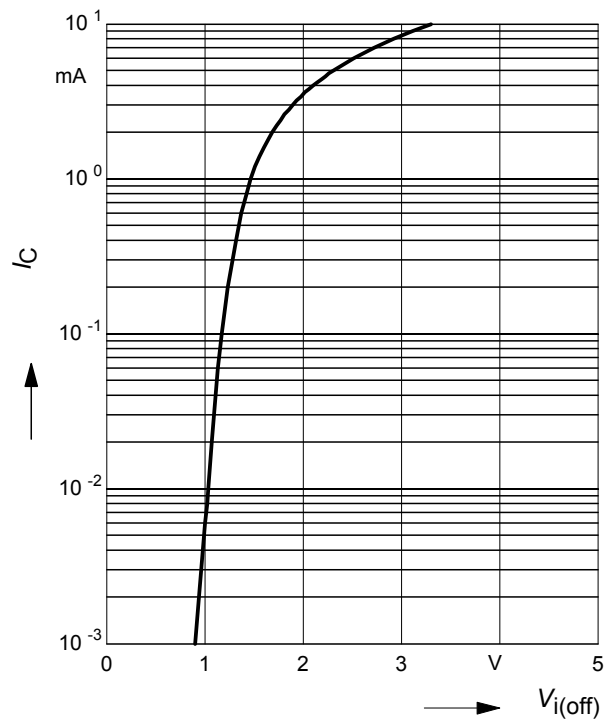
**Input on Voltage  $V_{i(on)} = f(I_C)$**

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



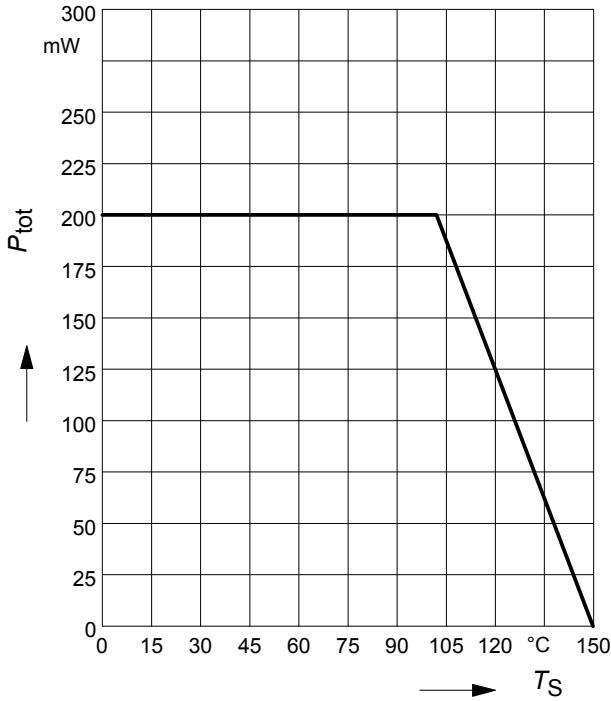
**Input off voltage  $V_{i(off)} = f(I_C)$**

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



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

BCR148



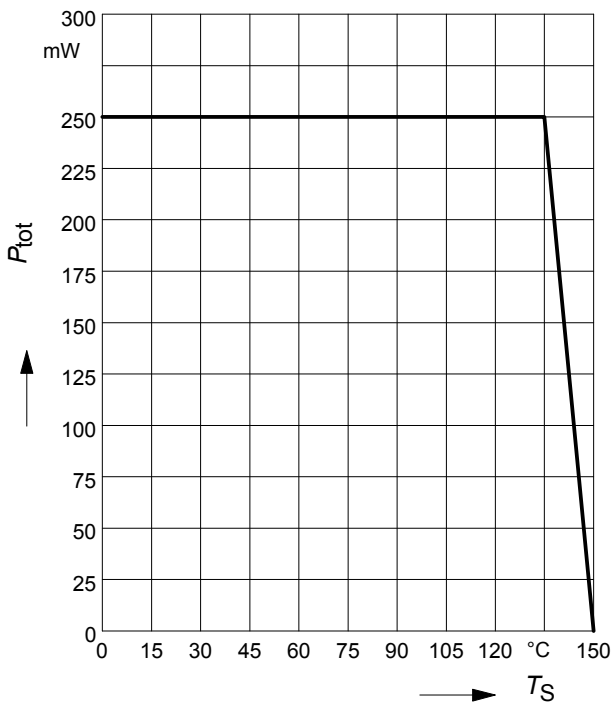
Total power dissipation  $P_{tot} = f(T_S)$

BCR148F



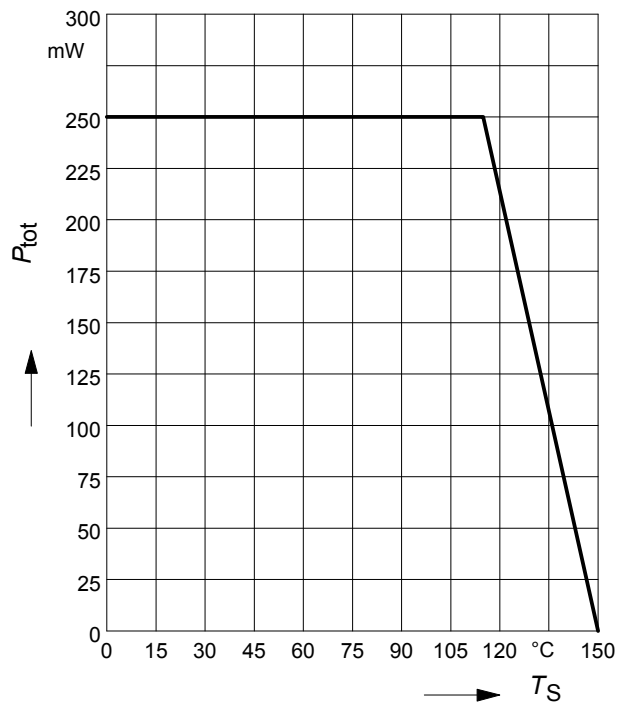
Total power dissipation  $P_{tot} = f(T_S)$

BCR148L3



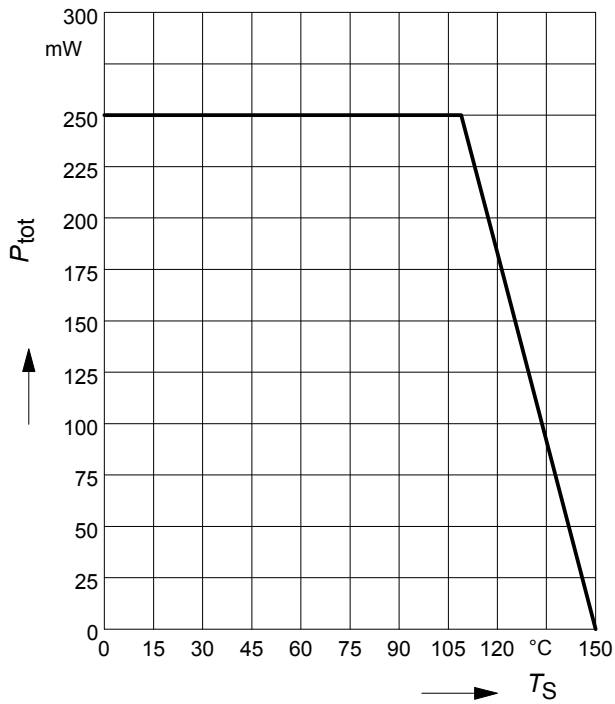
Total power dissipation  $P_{tot} = f(T_S)$

BCR148S



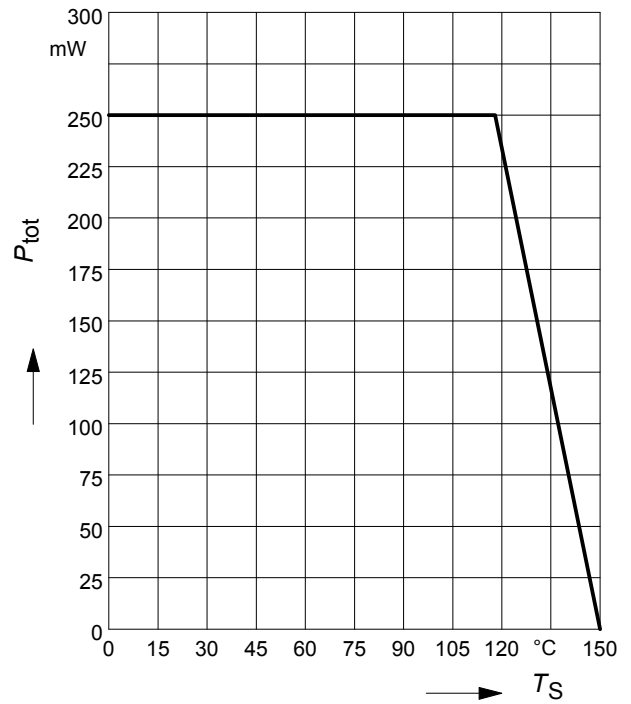
Total power dissipation  $P_{\text{tot}} = f(T_S)$

BCR148T



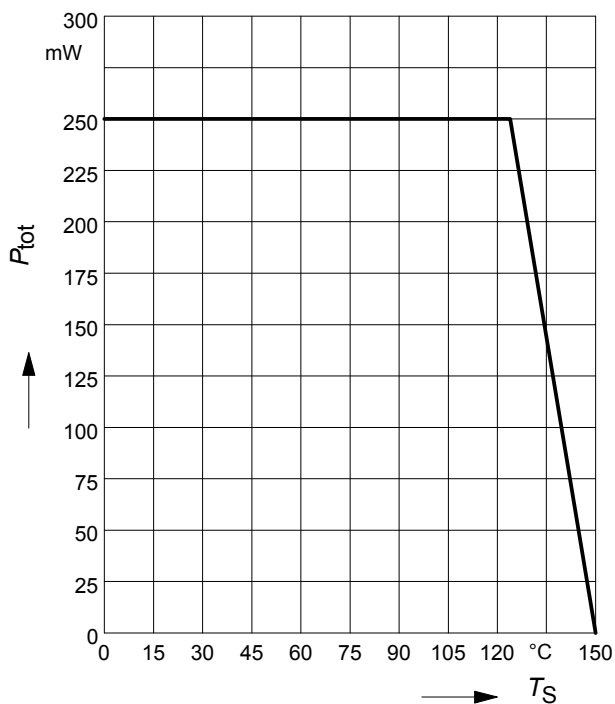
Total power dissipation  $P_{\text{tot}} = f(T_S)$

BCR148U



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

BCR148W



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

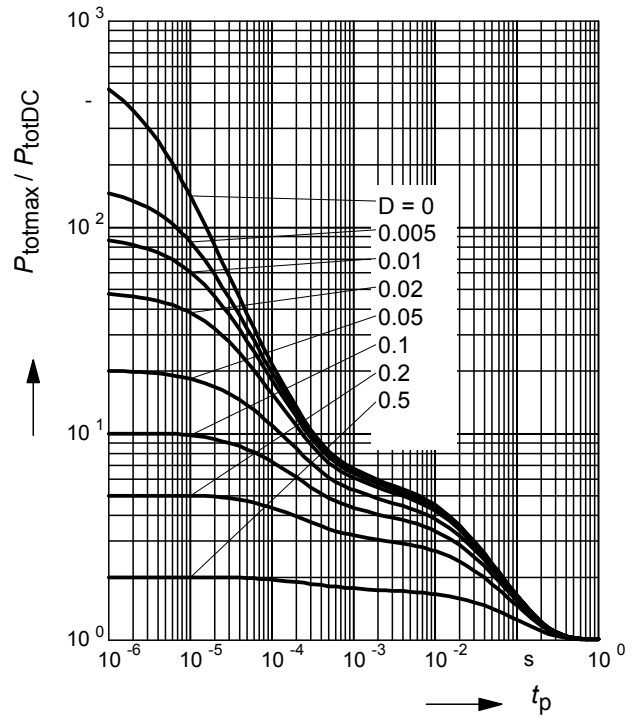
BCR148



**Permissible Pulse Load**

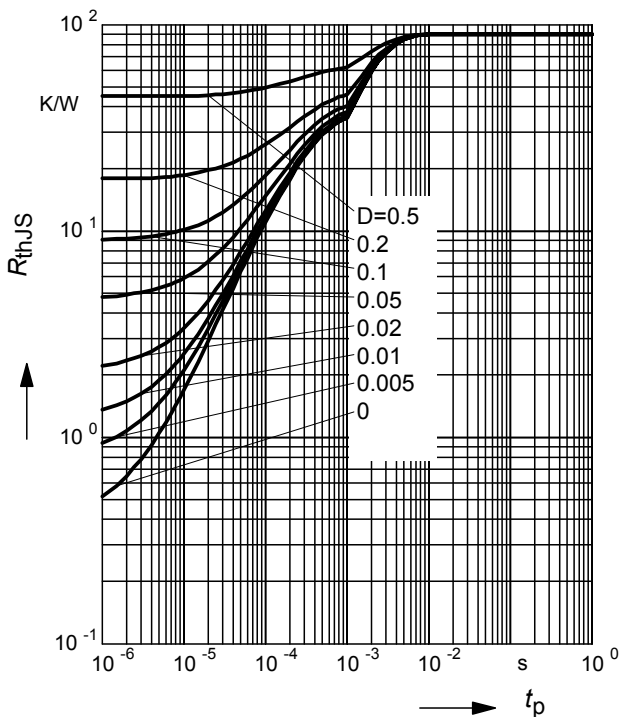
$P_{totmax}/P_{totDC} = f(t_p)$

BCR148



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

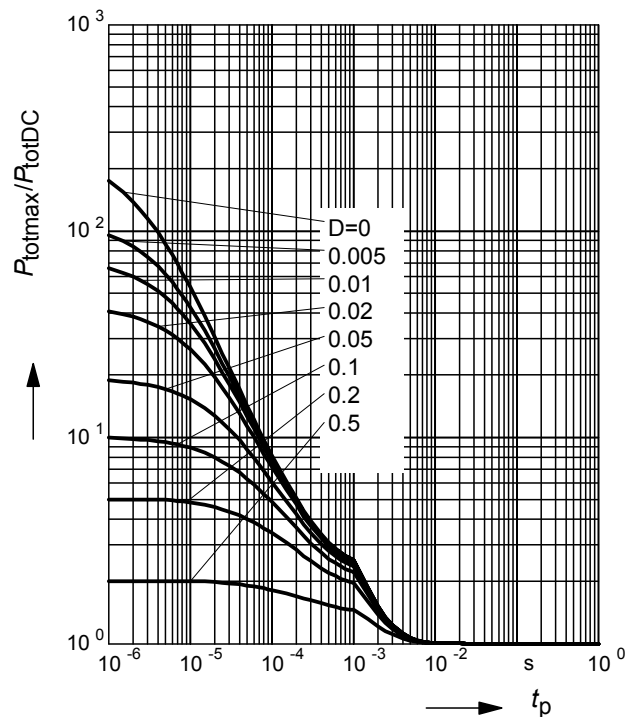
BCR148F



**Permissible Pulse Load**

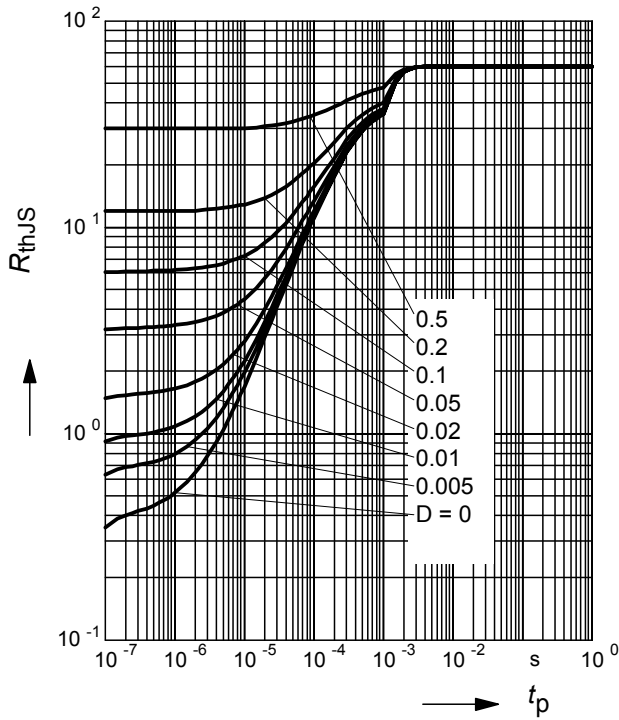
$P_{totmax}/P_{totDC} = f(t_p)$

BCR148F



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

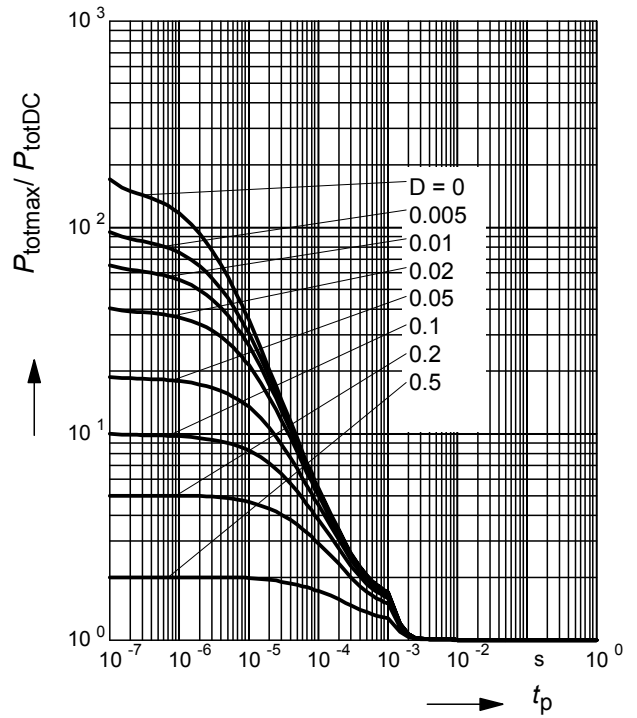
BCR148L3



**Permissible Pulse Load**

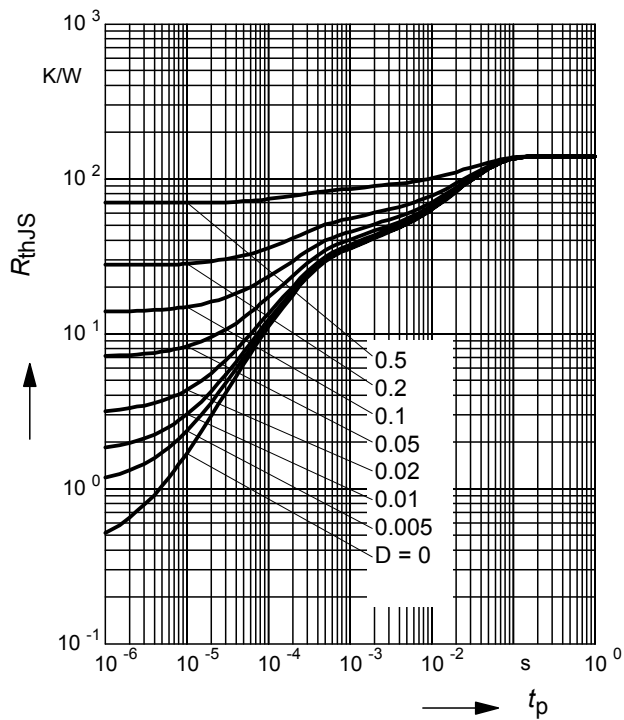
$P_{totmax}/P_{totDC} = f(t_p)$

BCR148L3



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

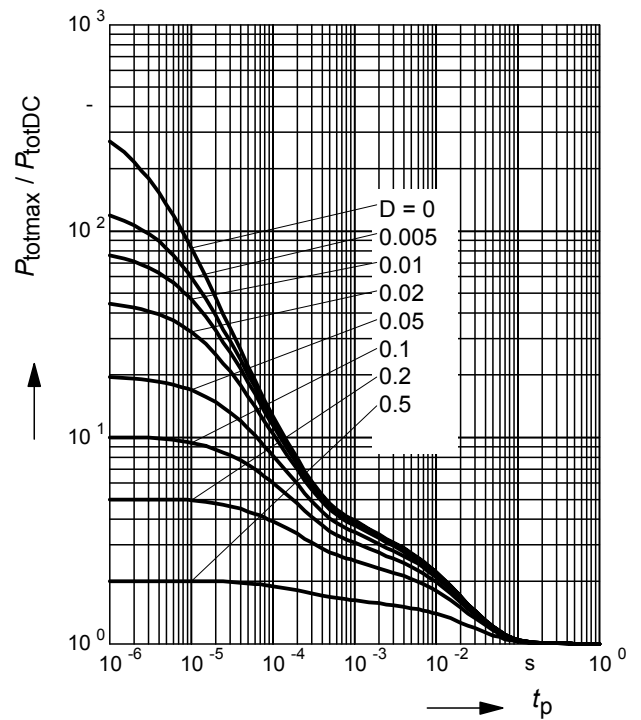
BCR148S



**Permissible Pulse Load**

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

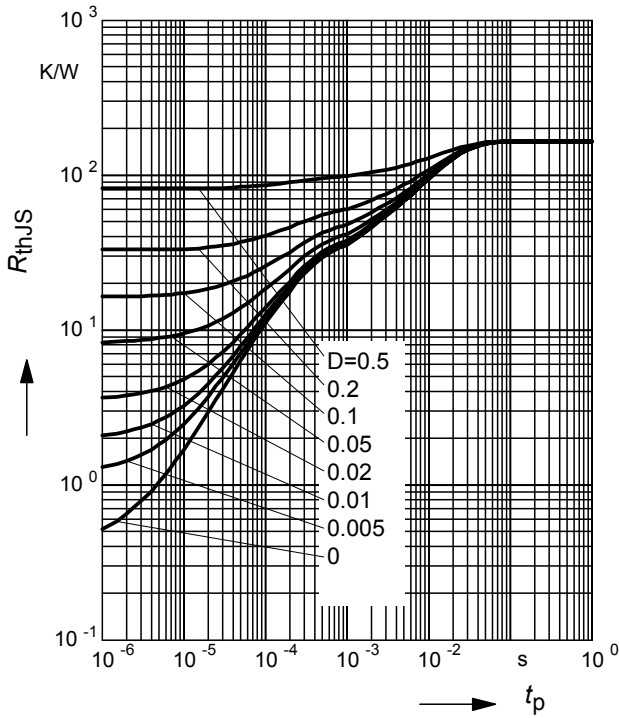
BCR148S





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

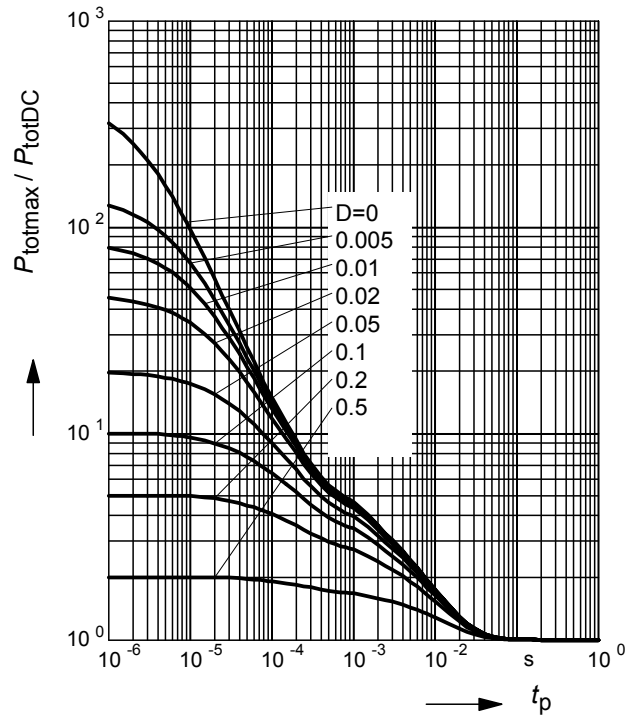
BCR148T



**Permissible Pulse Load**

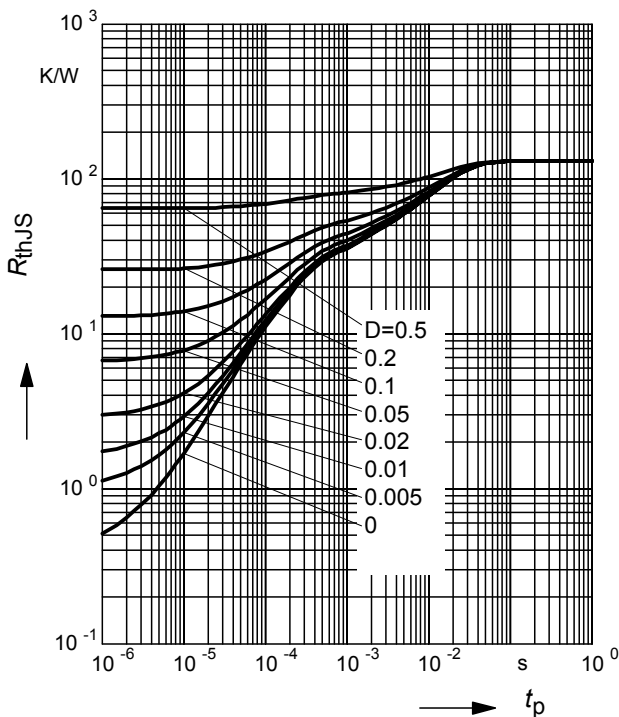
$P_{totmax}/P_{totDC} = f(t_p)$

BCR148T



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

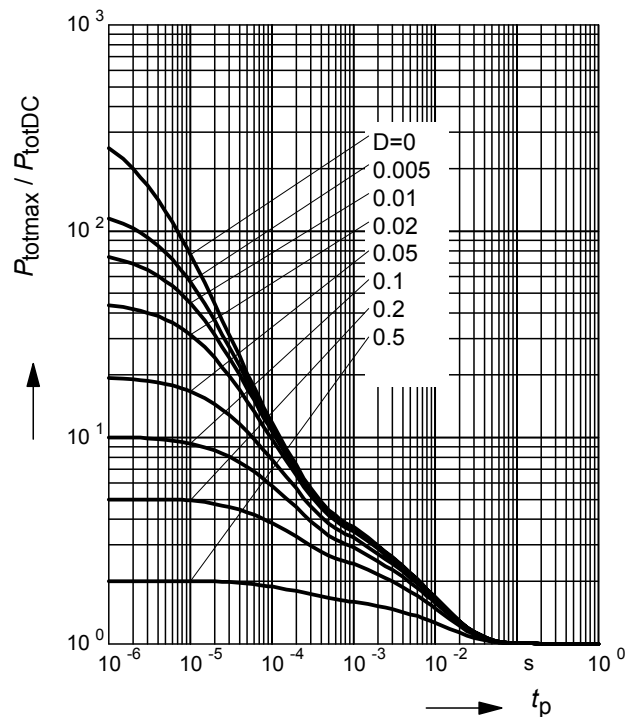
BCR148U



**Permissible Pulse Load**

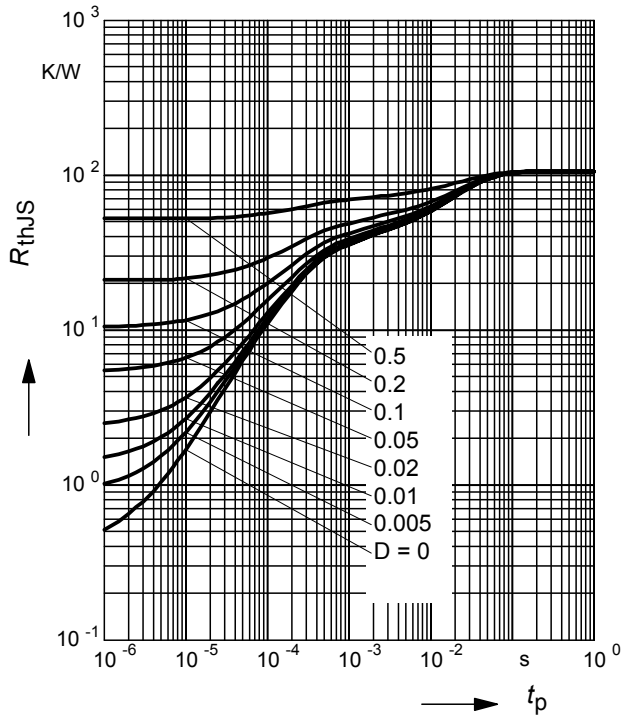
$P_{totmax}/P_{totDC} = f(t_p)$

BCR148U



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

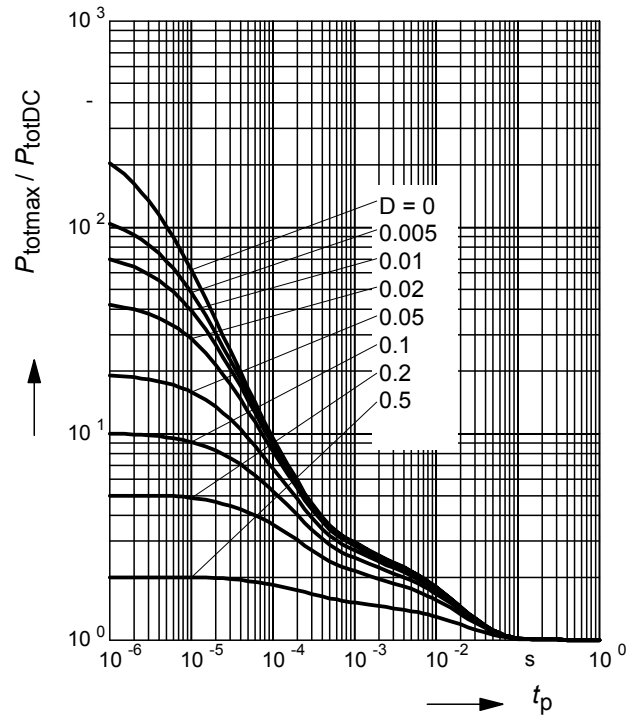
BCR148W



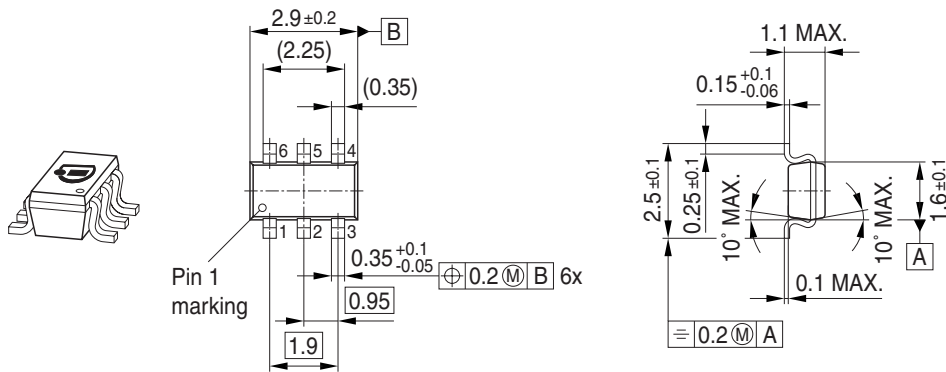
**Permissible Pulse Load**

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

BCR148W



Package Outline



Foot Print



Marking Layout (Example)

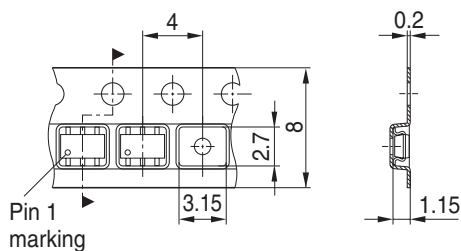
Small variations in positioning of Date code, Type code and Manufacture are possible.



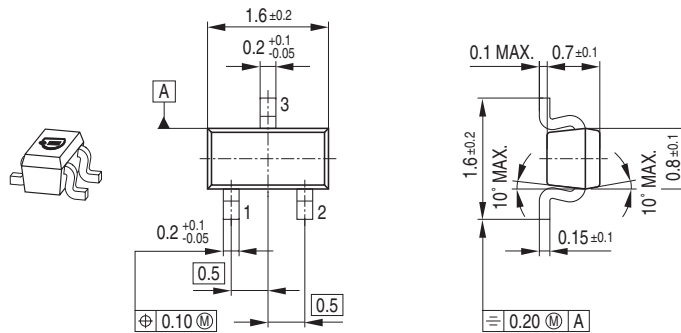
Standard Packing

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

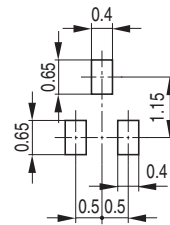
For symmetric types no defined Pin 1 orientation in reel.



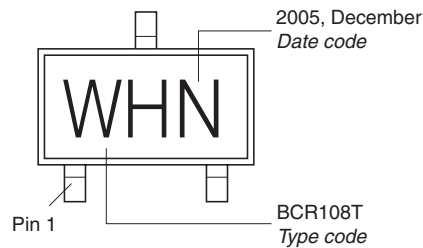
Package Outline



Foot Print

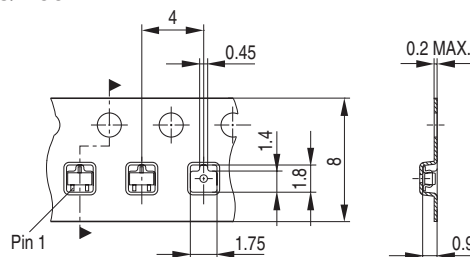


Marking Layout (Example)



Standard Packing

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

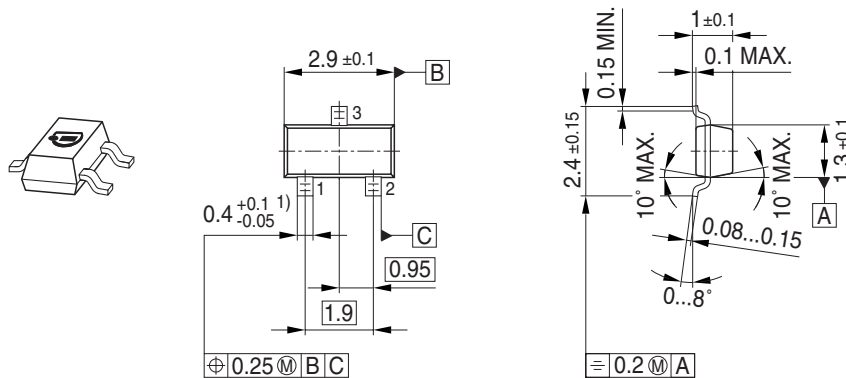


Date Code marking for discrete packages with one digit (SCD80, SC79, SC75<sup>1)</sup>) CES-Code

| 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    |

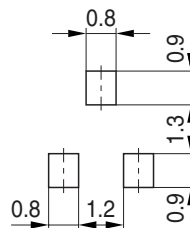
1) New Marking Layout for SC75, implemented at October 2005.

Package Outline

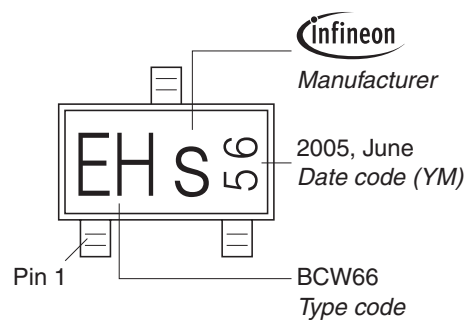


1) Lead width can be 0.6 max. in dambar area

Foot Print

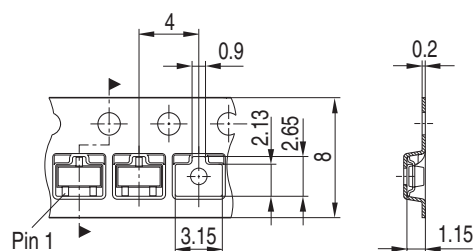


Marking Layout (Example)

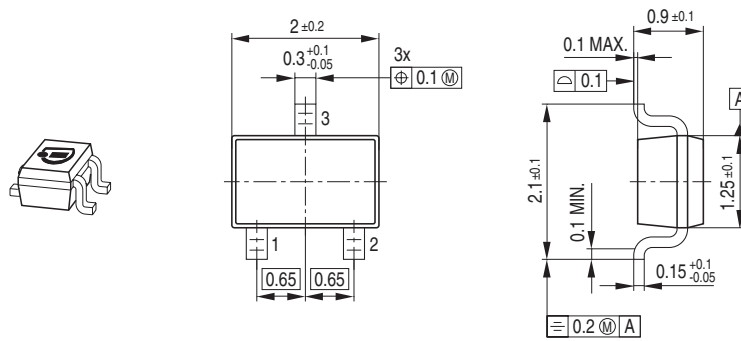


Standard Packing

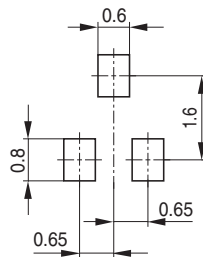
Reel  $\varnothing$ 180 mm = 3.000 Pieces/Reel  
 Reel  $\varnothing$ 330 mm = 10.000 Pieces/Reel



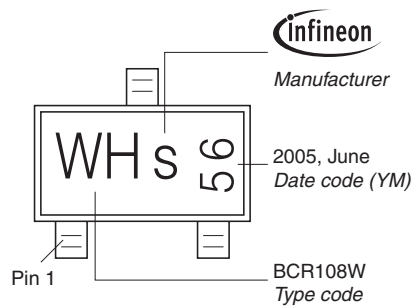
Package Outline



Foot Print

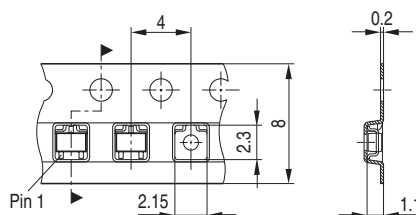


Marking Layout (Example)

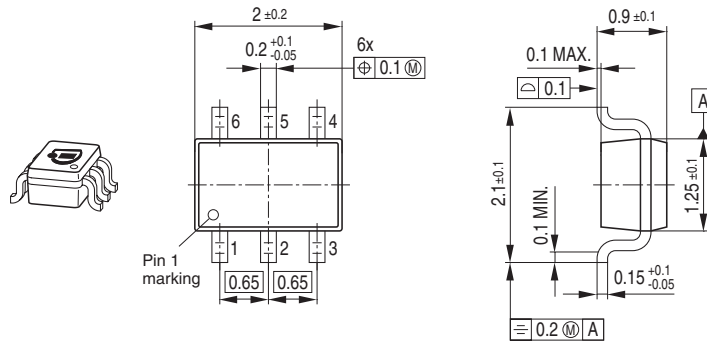


Standard Packing

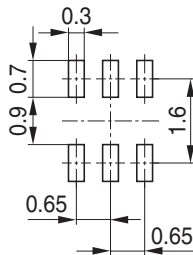
Reel  $\varnothing$ 180 mm = 3.000 Pieces/Reel  
 Reel  $\varnothing$ 330 mm = 10.000 Pieces/Reel



Package Outline

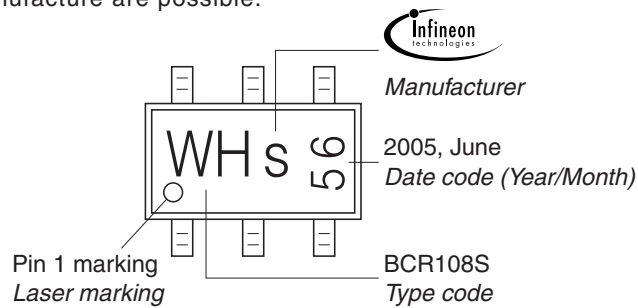


Foot Print



Marking Layout (Example)

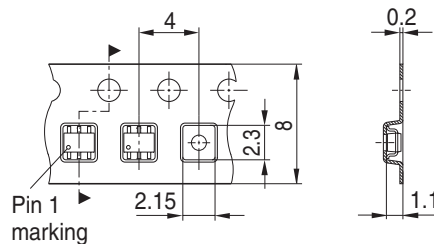
Small variations in positioning of Date code, Type code and Manufacture are possible.



Standard Packing

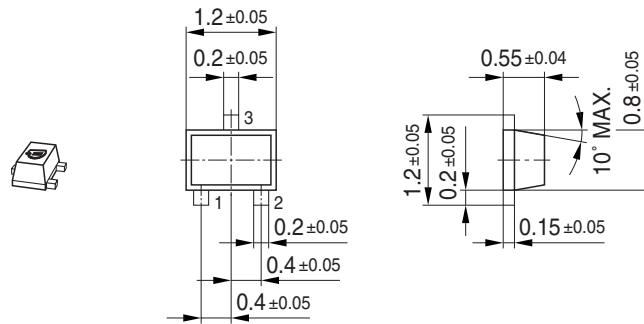
Reel  $\varnothing$ 180 mm = 3.000 Pieces/Reel  
 Reel  $\varnothing$ 330 mm = 10.000 Pieces/Reel

For symmetric types no defined Pin 1 orientation in reel.

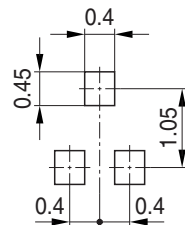




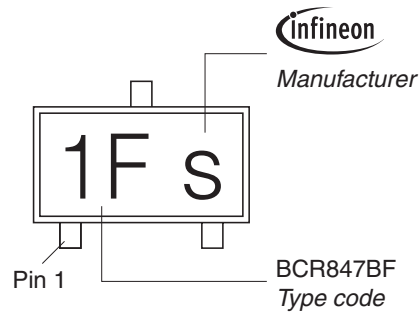
Package Outline



Foot Print

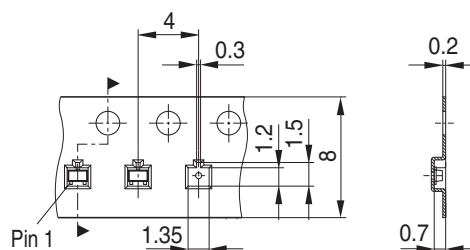


Marking Layout (Example)

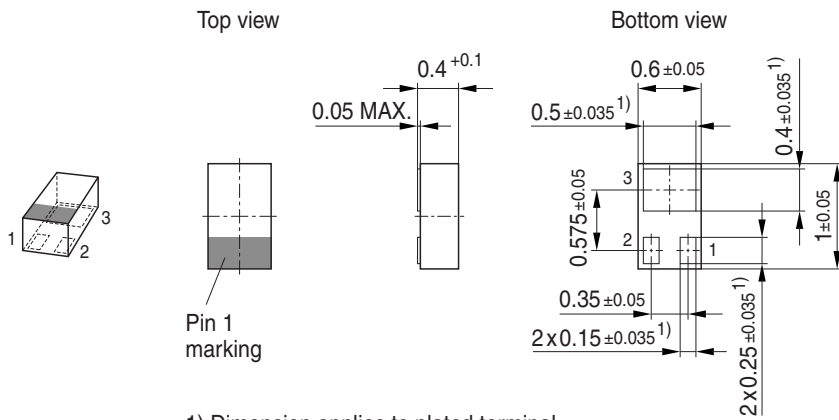


Standard Packing

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



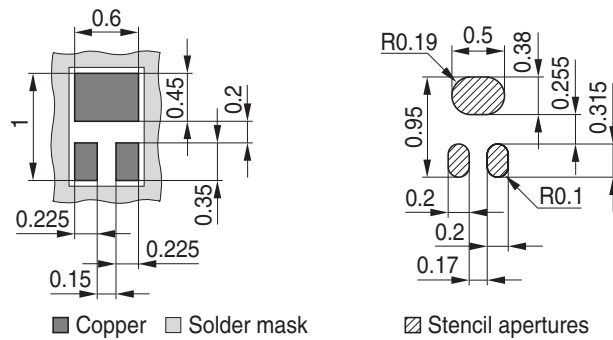
### Package Outline



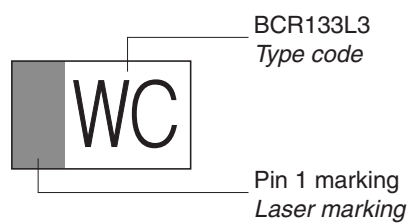
1) Dimension applies to plated terminal

### Foot Print

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

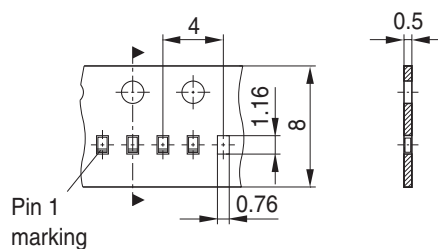


### Marking Layout



### Standard Packing

Reel ø180 mm = 15.000 Pieces/Reel



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