



**Maximum Ratings**

| Parameter   | Symbol      | Value                           | Unit             |
|---|-------------|---------------------------------|------------------|
| Collector-emitter voltage   | $V_{CEO}$   | 50                              | V                |
| Collector-base voltage  | $V_{CBO}$   | 50                              |                  |
| Emitter-base voltage  | $V_{EBO}$   | 10                              |                  |
| Input on voltage  | $V_{i(on)}$ | 50                              |                  |
| Collector current   | $I_C$       | 70                              | mA               |
| Total power dissipation-<br>BCR146, $T_S \leq 102^\circ\text{C}$<br>BCR146F, $T_S \leq 128^\circ\text{C}$<br>BCR146L3, $T_S \leq 135^\circ\text{C}$<br>BCR146T, $T_S \leq 109^\circ\text{C}$<br>BCR146W, $T_S \leq 124^\circ\text{C}$ | $P_{tot}$   | 200<br>250<br>250<br>250<br>250 | mW               |
| Junction temperature  | $T_j$       | 150                             | $^\circ\text{C}$ |
| Storage temperature   | $T_{stg}$   | -65 ... 150                     |                  |

**Thermal Resistance**

| Parameter                                | Symbol     | Value      | Unit |
|--|------------|------------|------|
| Junction - soldering point <sup>1)</sup> | $R_{thJS}$ |            | K/W  |
| BCR146                                   |            | $\leq 240$ |      |
| BCR146F                                  |            | $\leq 90$  |      |
| BCR146L3                                 |            | $\leq 60$  |      |
| BCR146T                                  |            | $\leq 165$ |      |
| BCR146W                                  |            | $\leq 105$ |      |

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

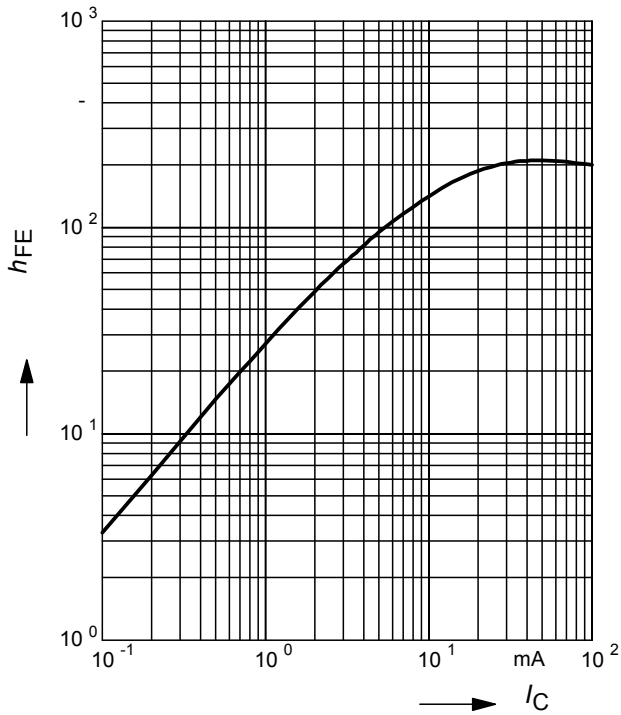
**Electrical Characteristics at  $T_A = 25^\circ\text{C}$ , unless otherwise specified**

| 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>$V_{EB} = 10 \text{ V}, I_C = 0$                                   | $I_{EBO}$     | -      | -    | 220  | $\mu\text{A}$    |
| DC current gain <sup>1)</sup><br>$I_C = 5 \text{ mA}, V_{CE} = 5 \text{ V}$                       | $h_{FE}$      | 50     | -    | -    | -                |
| 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>$I_C = 100 \mu\text{A}, V_{CE} = 5 \text{ V}$                                | $V_{i(off)}$  | 1.2    | -    | 2.6  |                  |
| Input on voltage<br>$I_C = 2 \text{ mA}, V_{CE} = 0.3 \text{ V}$                                  | $V_{i(on)}$   | 1.5    | -    | 4    |                  |
| Input resistor  | $R_1$         | 32     | 47   | 62   | $\text{k}\Omega$ |
| Resistor ratio  | $R_1/R_2$     | 1.92   | 2.14 | 2.36 | -                |
| <b>AC Characteristics</b>   |               |        |      |      |                  |
| Transition frequency<br>$I_C = 10 \text{ mA}, V_{CE} = 5 \text{ V}, f = 100 \text{ MHz}$          | $f_T$         | -      | 150  | -    | MHz              |
| Collector-base capacitance<br>$V_{CB} = 10 \text{ V}, f = 1 \text{ MHz}$                          | $C_{cb}$      | -      | 3    | -    | pF               |

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

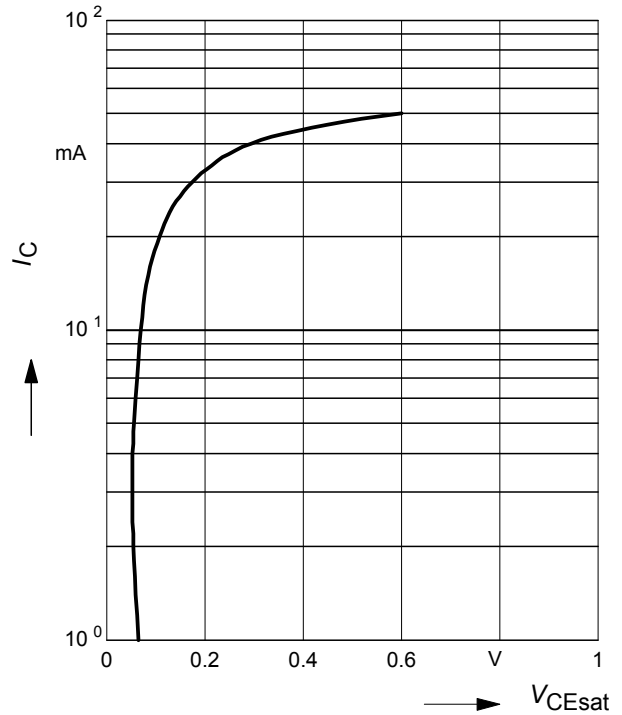
**DC current gain  $h_{FE} = f(I_C)$**

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



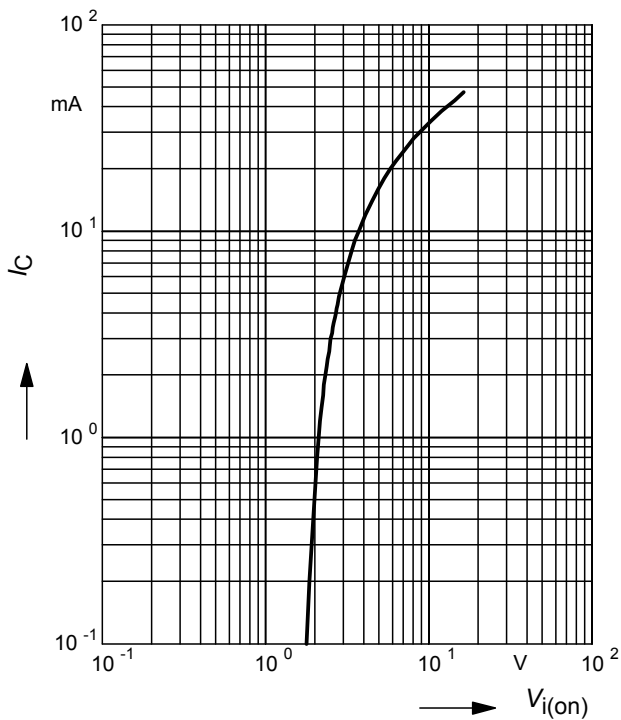
**Collector-emitter saturation voltage**

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



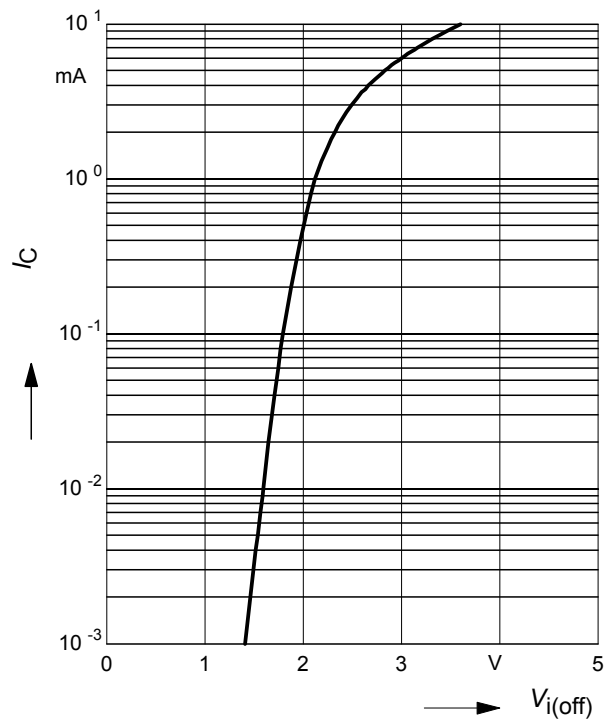
**Input on Voltage  $V_{i(on)} = f(I_C)$**

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



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

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



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

BCR146



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

BCR146F



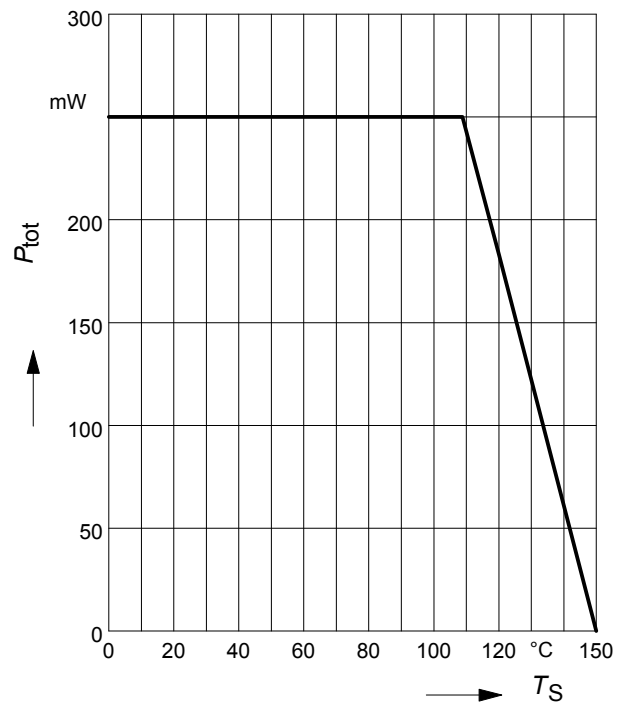
**Total power dissipation  $P_{tot} = f(T_S)$**

BCR146L3



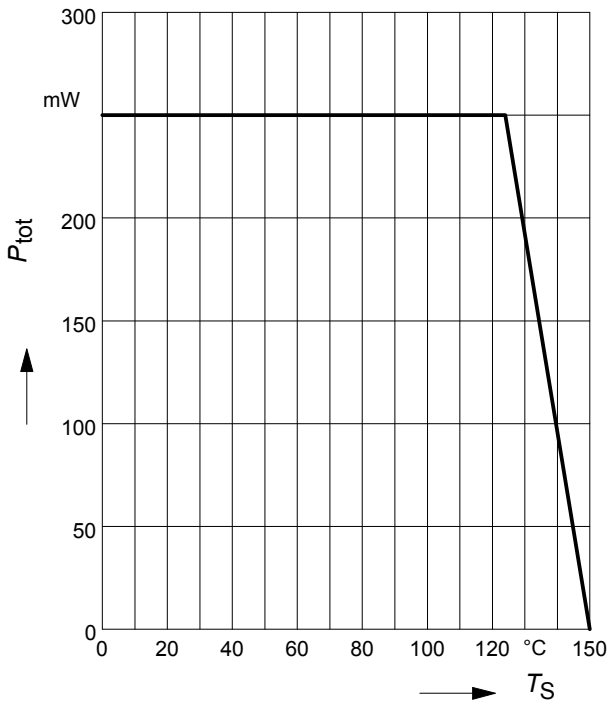
**Total power dissipation  $P_{tot} = f(T_S)$**

BCR146T



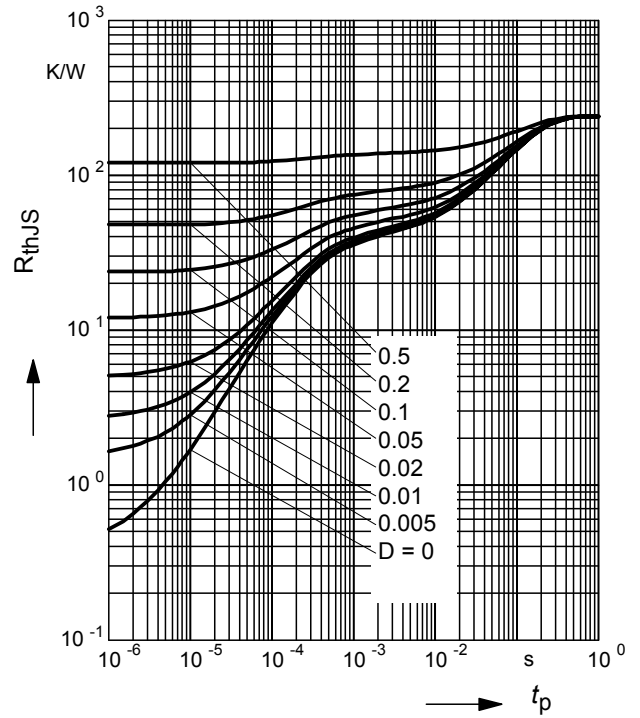
**Total power dissipation  $P_{tot} = f(T_S)$**

BCR146W



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

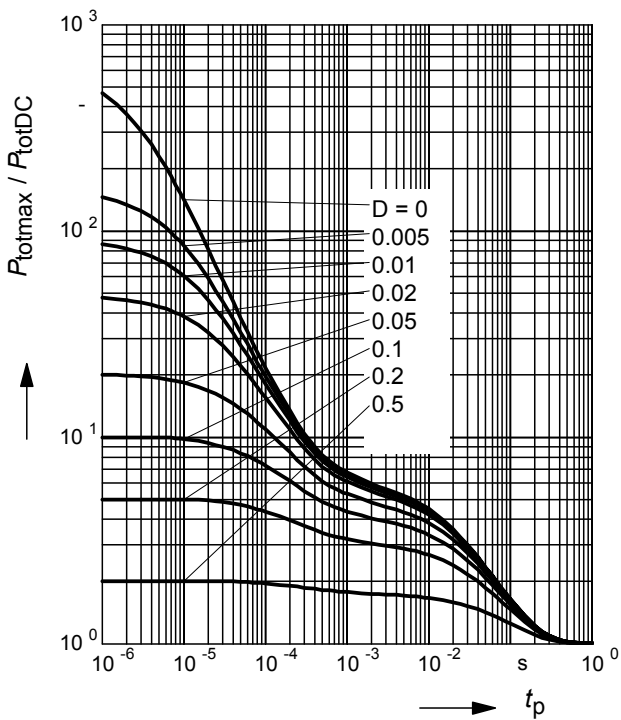
BCR146



**Permissible Pulse Load**

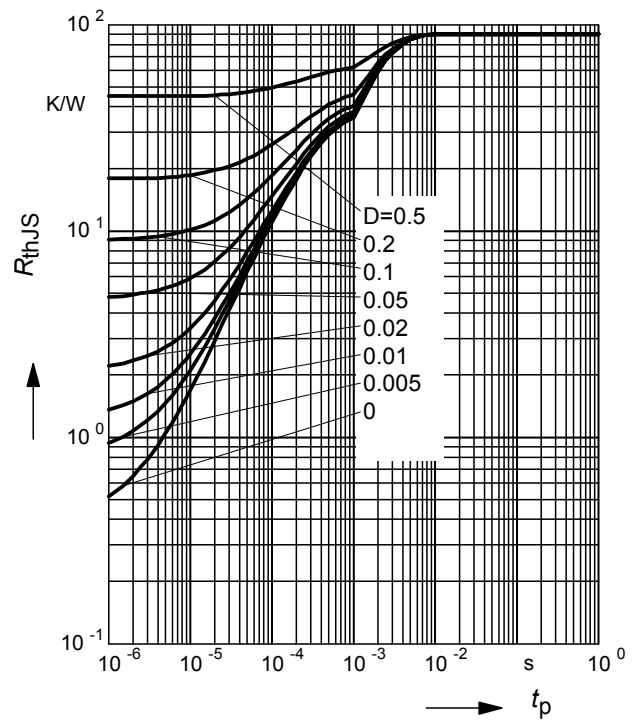
$P_{totmax}/P_{totDC} = f(t_p)$

BCR146



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

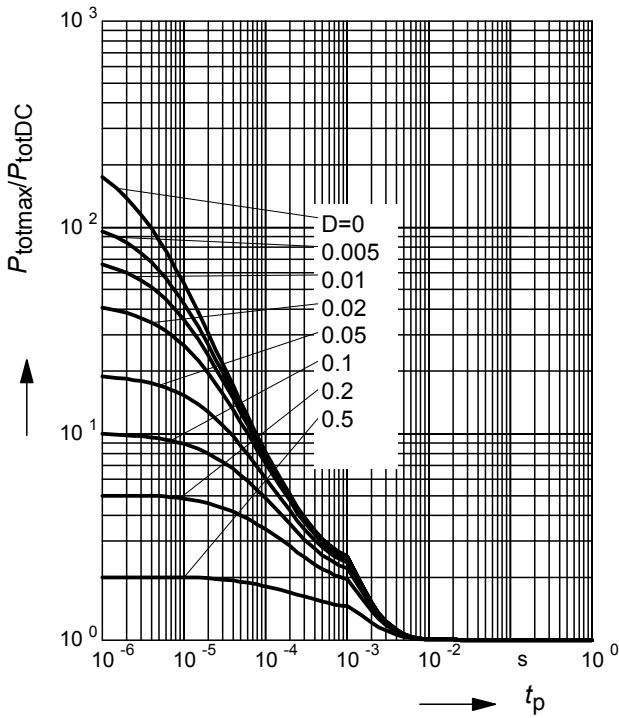
BCR146F



**Permissible Pulse Load**

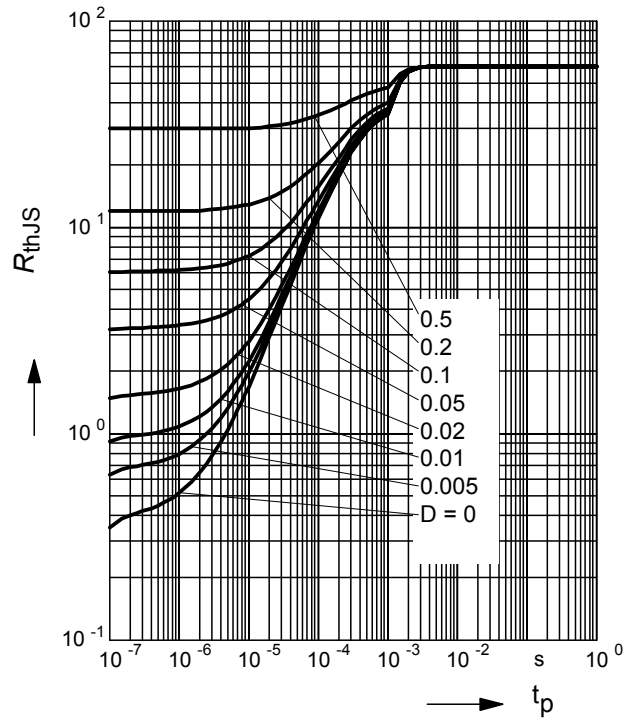
$$P_{\text{totmax}}/P_{\text{totDC}} = f(t_p)$$

BCR146F



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

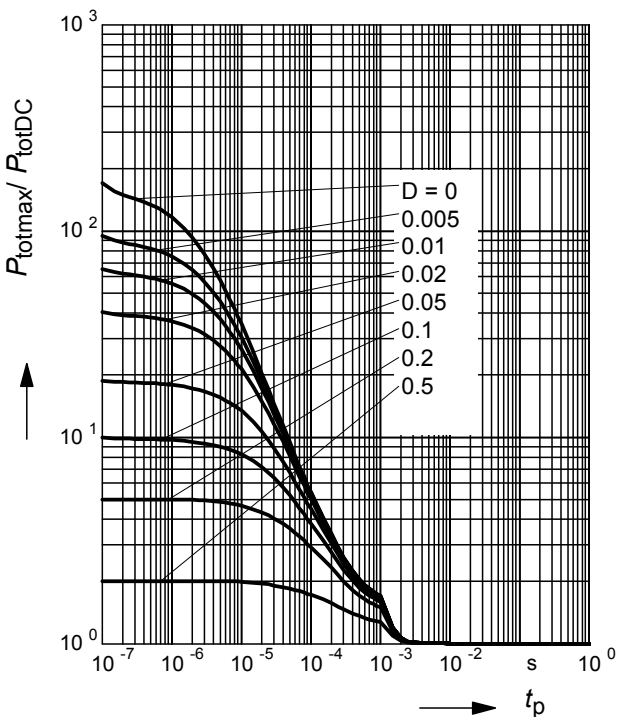
BCR146L3



**Permissible Pulse Load**

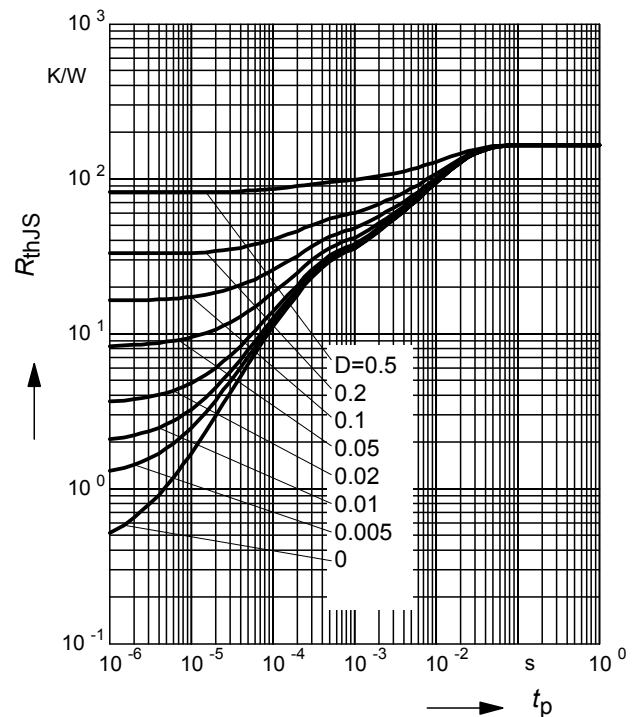
$$P_{\text{totmax}}/P_{\text{totDC}} = f(t_p)$$

BCR146L3



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

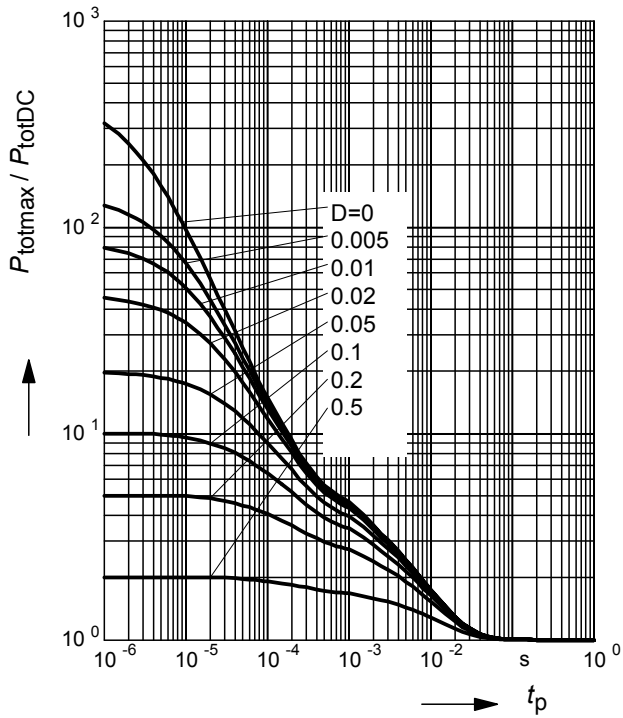
BCR146T



**Permissible Pulse Load**

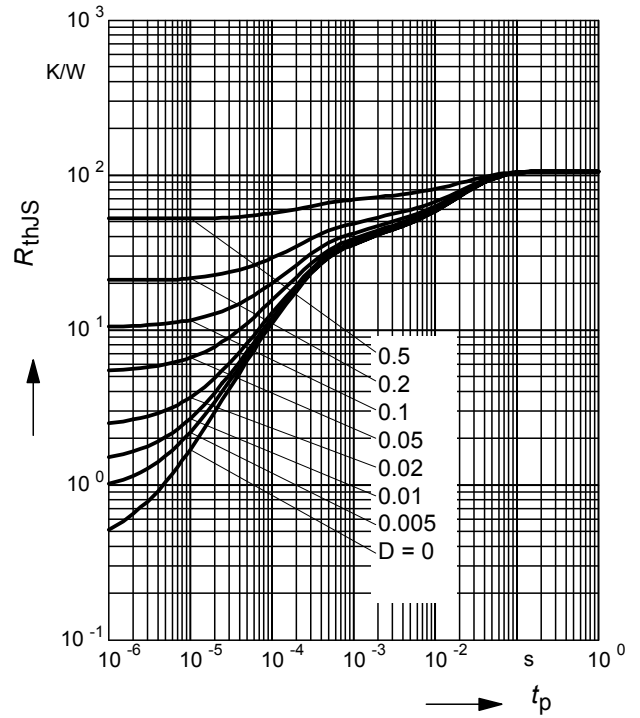
$$P_{\text{totmax}}/P_{\text{totDC}} = f(t_p)$$

BCR146T



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

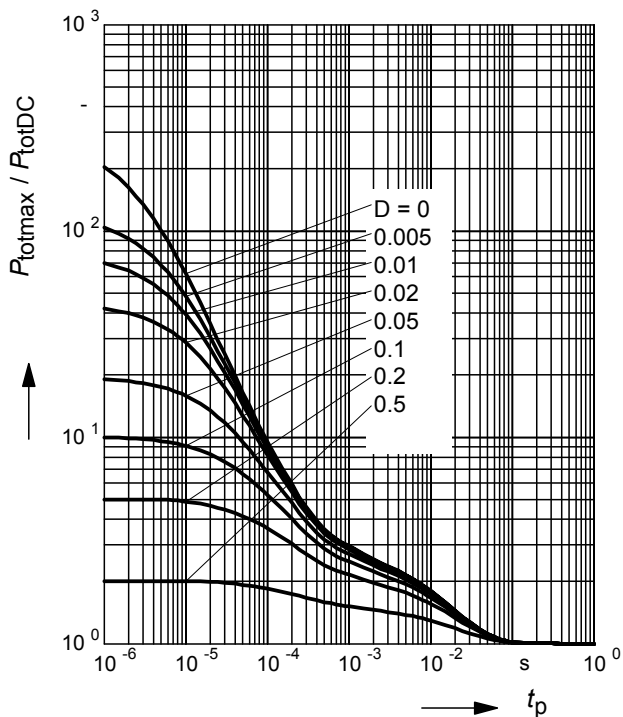
BCR146W



**Permissible Pulse Load**

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

BCR146W





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