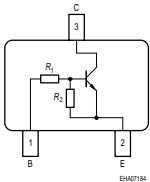


**NPN Silicon Digital Transistor**

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



**BCR146/F/L3**  
**BCR146T/W**



Type	Marking	Pin Configuration						Package
		1=B	2=E	3=C	-	-	-	
BCR146	WLs	1=B	2=E	3=C	-	-	-	SOT23
BCR146F	WLs	1=B	2=E	3=C	-	-	-	TSFP-3
BCR146L3	WL	1=B	2=E	3=C	-	-	-	TSLP-3-4
BCR146T	WLs	1=B	2=E	3=C	-	-	-	SC75
BCR146W	WLs	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	
Emitter-base voltage	$V_{EBO}$	10	
Input on voltage	$V_{i(on)}$	50	
Collector current	$I_C$	70	mA
Total power dissipation- BCR146, $T_S \leq 102^\circ\text{C}$ BCR146F, $T_S \leq 128^\circ\text{C}$ BCR146L3, $T_S \leq 135^\circ\text{C}$ BCR146T, $T_S \leq 109^\circ\text{C}$ BCR146W, $T_S \leq 124^\circ\text{C}$	$P_{tot}$	200 250 250 250 250	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

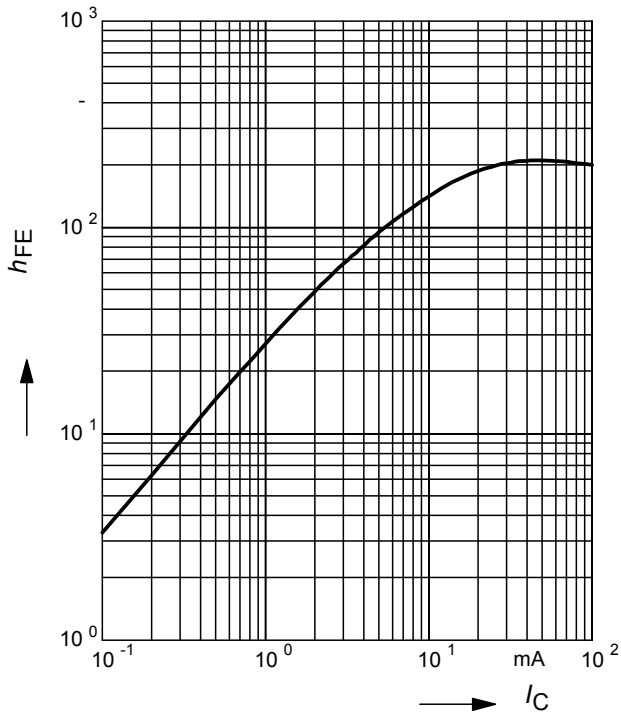
**Electrical Characteristics at  $T_A = 25^\circ\text{C}$ , unless otherwise specified**

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
<b>DC Characteristics</b>					
Collector-emitter breakdown voltage $I_C = 100 \mu\text{A}, I_B = 0$	$V_{(BR)CEO}$	50	-	-	V
Collector-base breakdown voltage $I_C = 10 \mu\text{A}, I_E = 0$	$V_{(BR)CBO}$	50	-	-	
Collector-base cutoff current $V_{CB} = 40 \text{ V}, I_E = 0$	$I_{CBO}$	-	-	100	nA
Emitter-base cutoff current $V_{EB} = 10 \text{ V}, I_C = 0$	$I_{EBO}$	-	-	220	$\mu\text{A}$
DC current gain <sup>1)</sup> $I_C = 5 \text{ mA}, V_{CE} = 5 \text{ V}$	$h_{FE}$	50	-	-	-
Collector-emitter saturation voltage <sup>1)</sup> $I_C = 10 \text{ mA}, I_B = 0.5 \text{ mA}$	$V_{CEsat}$	-	-	0.3	V
Input off voltage $I_C = 100 \mu\text{A}, V_{CE} = 5 \text{ V}$	$V_{i(off)}$	1.2	-	2.6	
Input on voltage $I_C = 2 \text{ mA}, V_{CE} = 0.3 \text{ V}$	$V_{i(on)}$	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 $I_C = 10 \text{ mA}, V_{CE} = 5 \text{ V}, f = 100 \text{ MHz}$	$f_T$	-	150	-	MHz
Collector-base capacitance $V_{CB} = 10 \text{ V}, f = 1 \text{ MHz}$	$C_{cb}$	-	3	-	pF

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

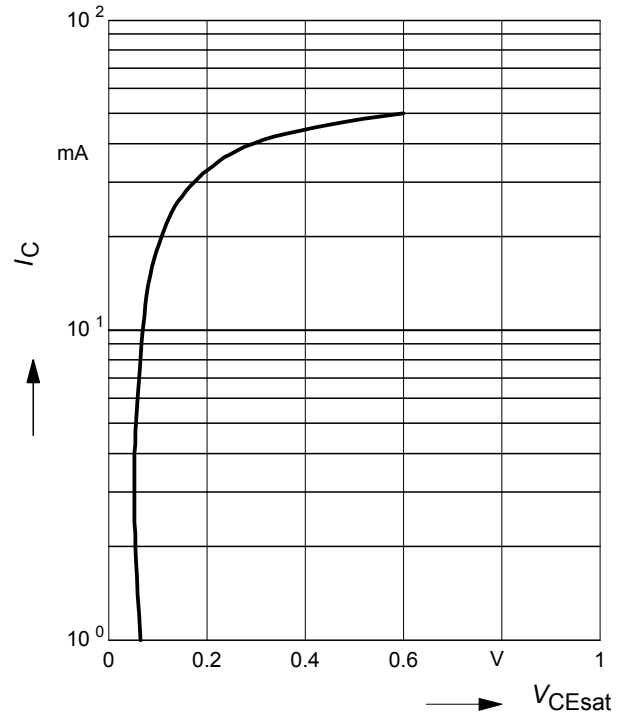
**DC current gain  $h_{FE} = f(I_C)$**

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



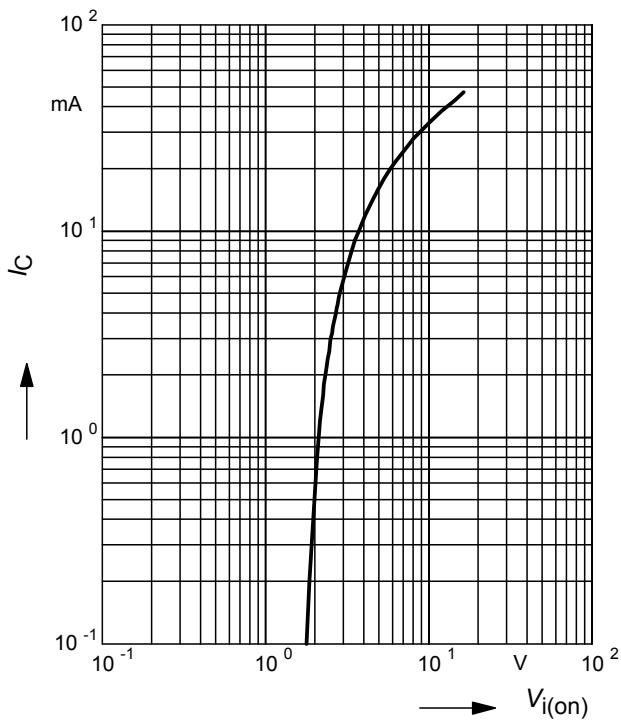
**Collector-emitter saturation voltage**

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



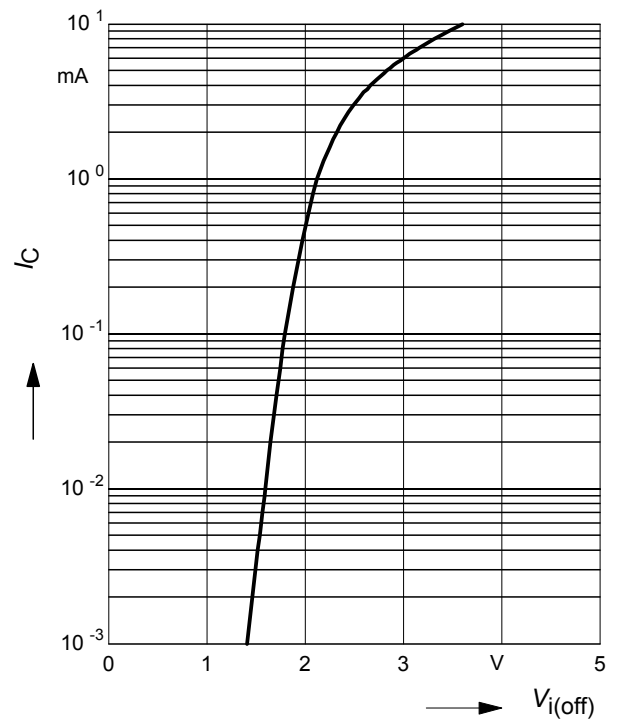
**Input on Voltage  $V_{i(on)} = f(I_C)$**

$V_{CE} = 0.3V$  (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



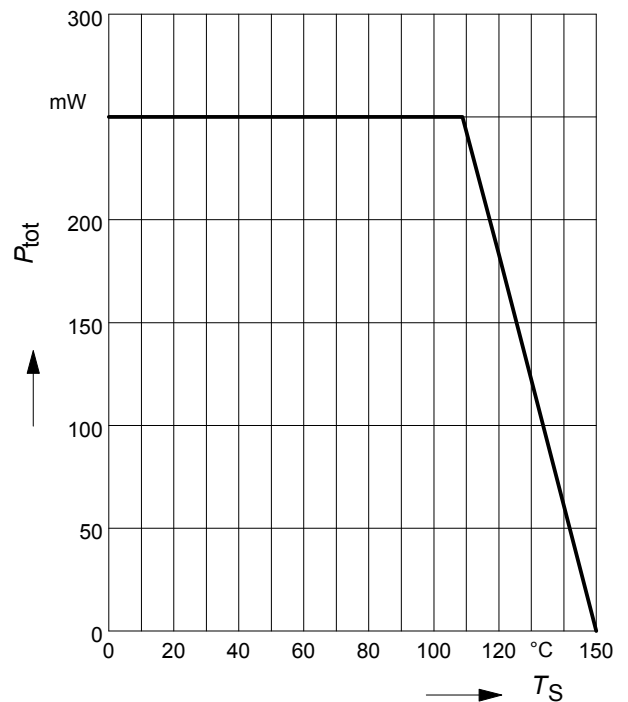
Total power dissipation  $P_{tot} = f(T_S)$

BCR146L3



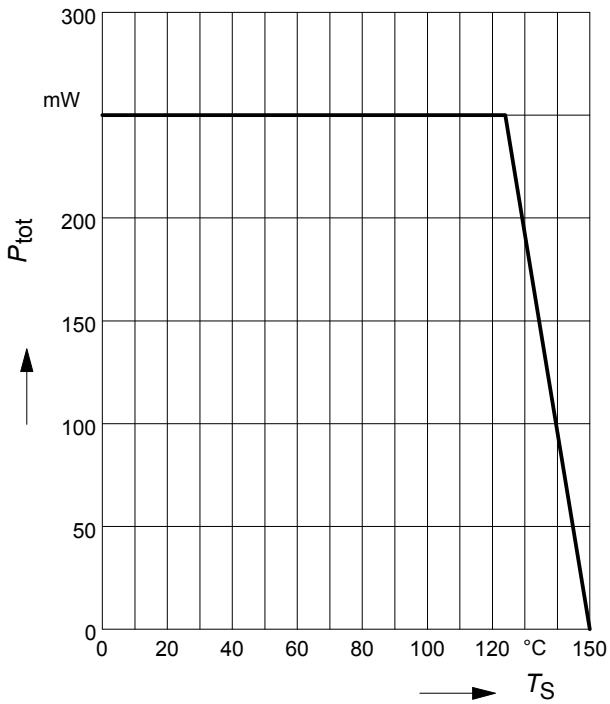
Total power dissipation  $P_{tot} = f(T_S)$

BCR146T



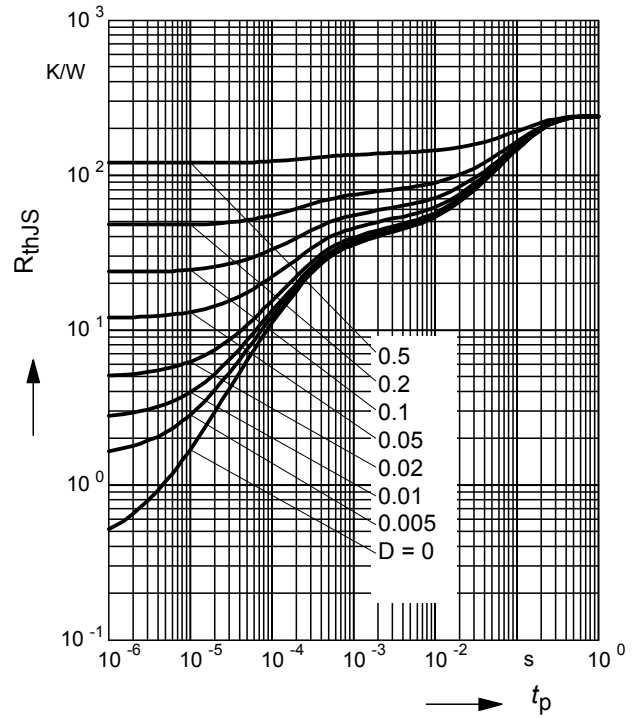
**Total power dissipation  $P_{tot} = f(T_S)$**

BCR146W



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

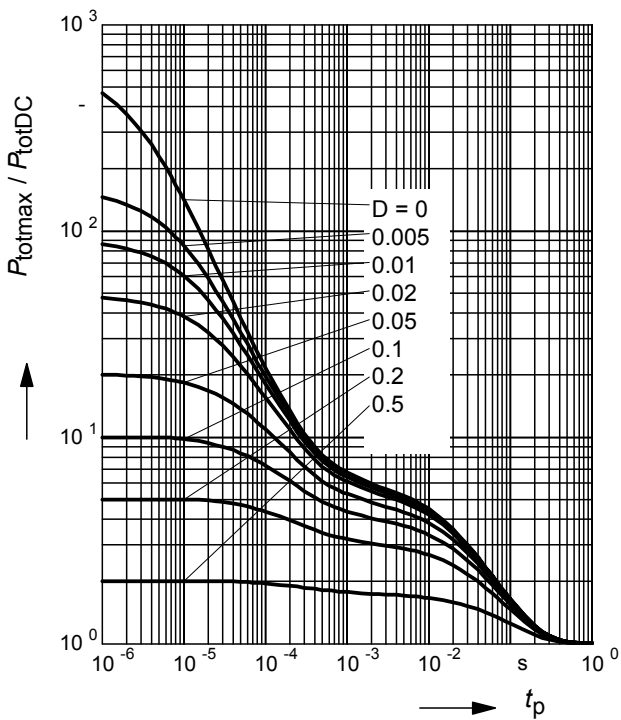
BCR146



**Permissible Pulse Load**

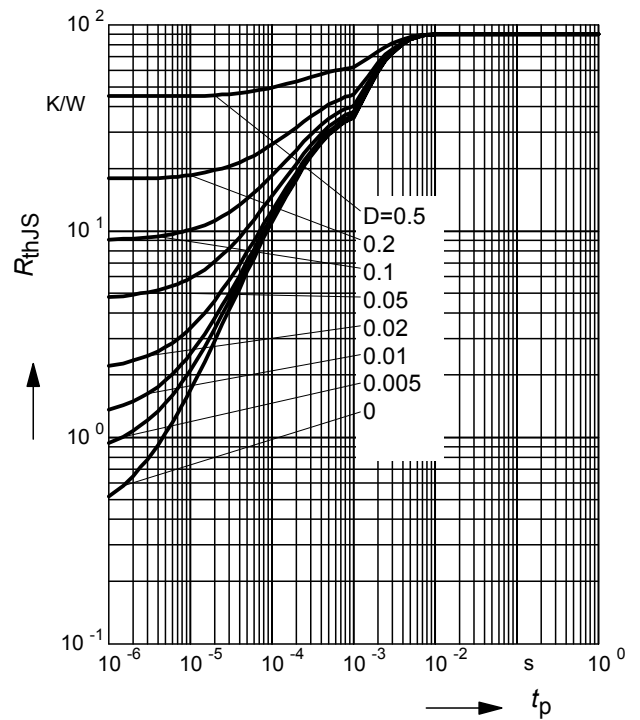
$P_{totmax}/P_{totDC} = f(t_p)$

BCR146



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

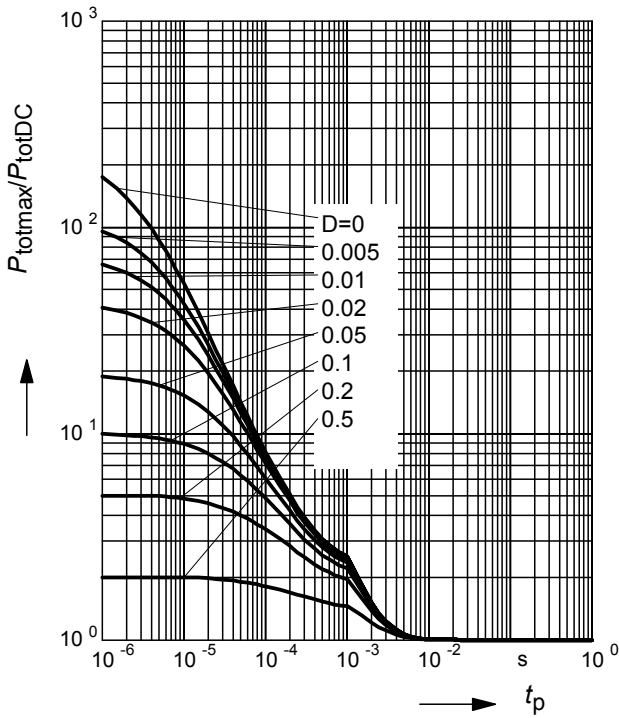
BCR146F



**Permissible Pulse Load**

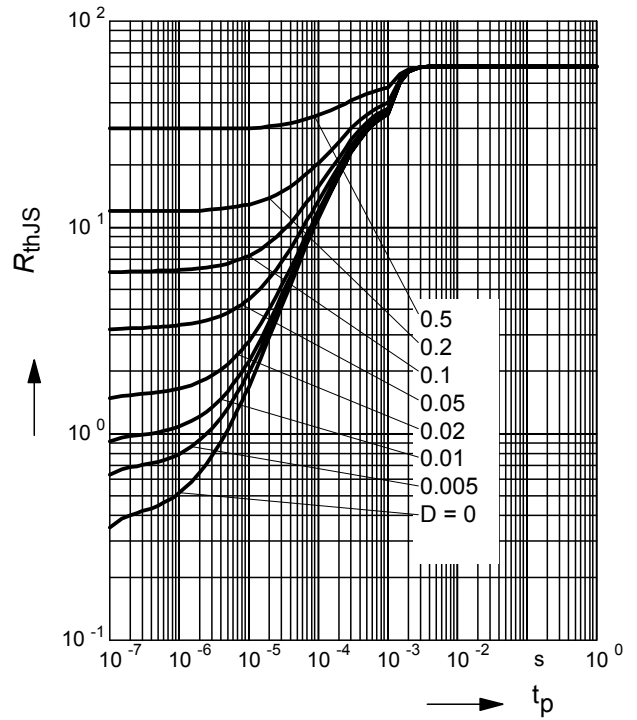
$$P_{\text{totmax}}/P_{\text{totDC}} = f(t_p)$$

BCR146F



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

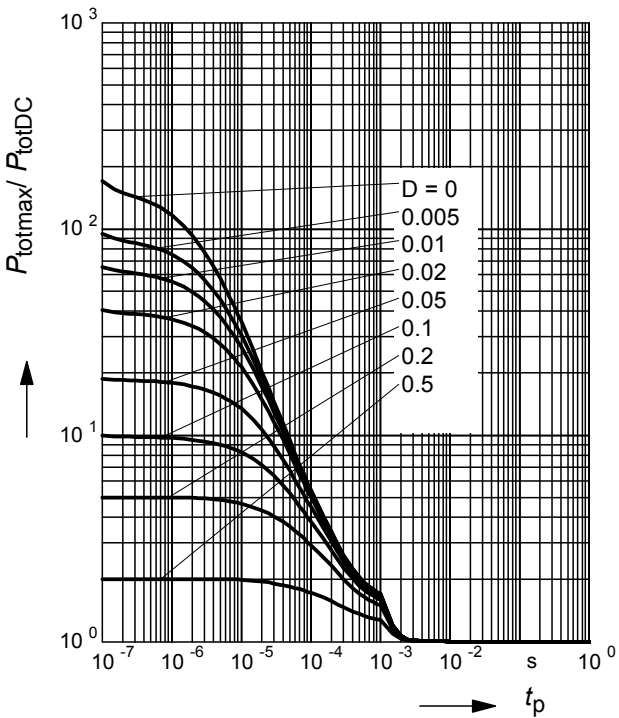
BCR146L3



**Permissible Pulse Load**

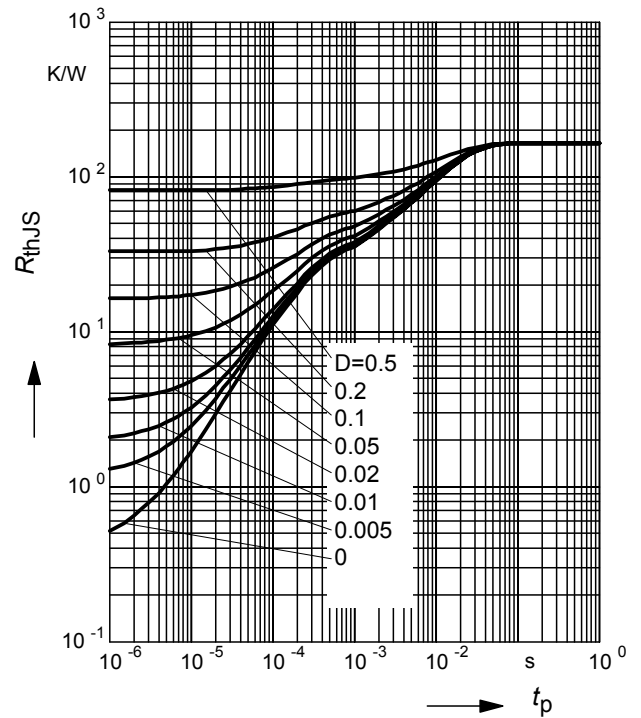
$$P_{\text{totmax}}/P_{\text{totDC}} = f(t_p)$$

BCR146L3



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

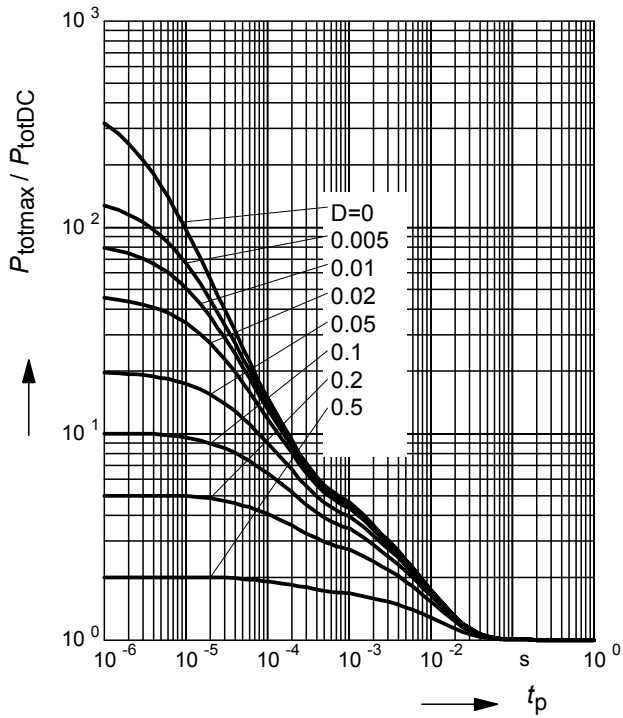
BCR146T



**Permissible Pulse Load**

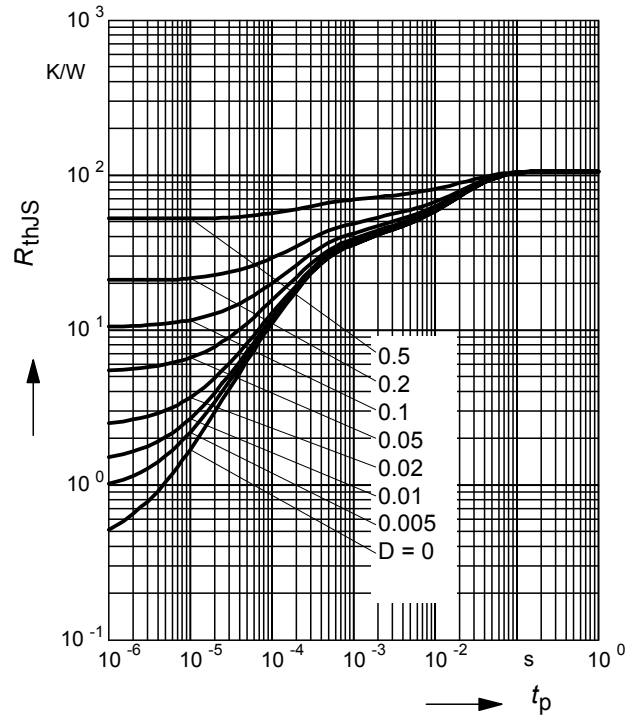
$$P_{\text{totmax}}/P_{\text{totDC}} = f(t_p)$$

BCR146T



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

BCR146W



**Permissible Pulse Load**

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

BCR146W

