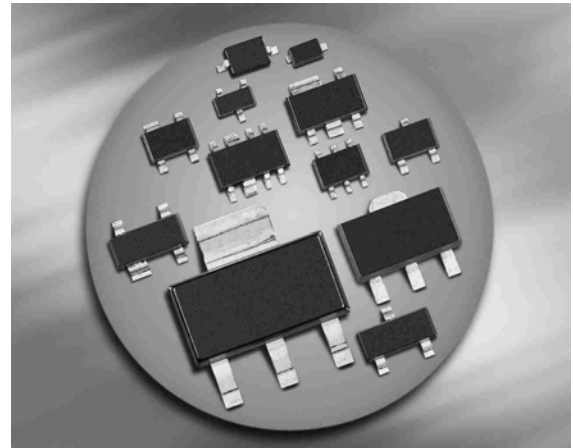
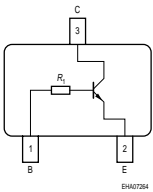


**NPN Silicon Digital Transistor**

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



**BCR139/F/L3  
BCR139T**



Type	Marking	Pin Configuration						Package
		1=B	2=E	3=C	-	-	-	
BCR139	WYs	1=B	2=E	3=C	-	-	-	SOT23
BCR139F	WYs	1=B	2=E	3=C	-	-	-	TSFP-3
BCR139L3	WY	1=B	2=E	3=C	-	-	-	TSLP-3-4
BCR139T	WYs	1=B	2=E	3=C	-	-	-	SC75

**Maximum Ratings**

Parameter	Symbol	Value	Unit
Collector-emitter voltage	$V_{CEO}$	50	V
Collector-base voltage	$V_{CBO}$	50	
Emitter-base voltage	$V_{EBO}$	5	
Input on voltage	$V_{i(on)}$	30	
Collector current	$I_C$	100	mA
Total power dissipation- BCR139, $T_S \leq 102^\circ\text{C}$ BCR139F, $T_S \leq 128^\circ\text{C}$ BCR139L3, $T_S \leq 135^\circ\text{C}$ BCR139T, $T_S \leq 109^\circ\text{C}$	$P_{tot}$	200 250 250 250	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> BCR139 BCR139F BCR139L3 BCR139T	$R_{thJS}$	$\leq 240$ $\leq 90$ $\leq 60$ $\leq 165$	K/W

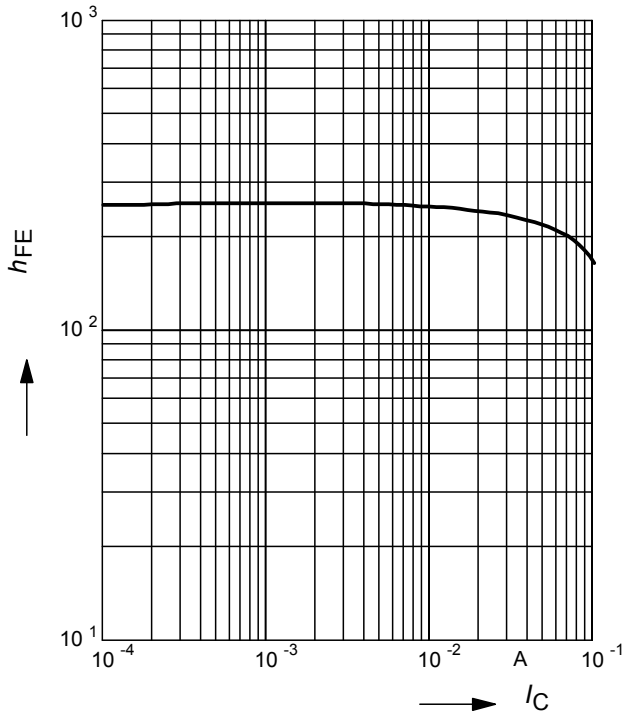
<sup>1</sup>For calculation of  $R_{thJA}$  please refer to Application Note Thermal Resistance

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

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
<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	-	-	
Emitter-base breakdown voltage $I_E = 10 \mu\text{A}, I_C = 0$	$V_{(BR)EBO}$	5	-	-	
Collector-base cutoff current $V_{CB} = 40 \text{ V}, I_E = 0$	$I_{CBO}$	-	-	100	nA
DC current gain <sup>1)</sup> $I_C = 5 \text{ mA}, V_{CE} = 5 \text{ V}$	$h_{FE}$	120	-	630	-
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 $I_C = 100 \mu\text{A}, V_{CE} = 5 \text{ V}$	$V_{i(off)}$	0.4	-	0.8	
Input on voltage $I_C = 2 \text{ mA}, V_{CE} = 0.3 \text{ V}$	$V_{i(on)}$	0.5	-	1.1	
Input resistor	$R_1$	15	22	29	k $\Omega$
<sup>1)</sup> Pulse test: $t < 300 \mu\text{s}; D < 2\%$					
<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

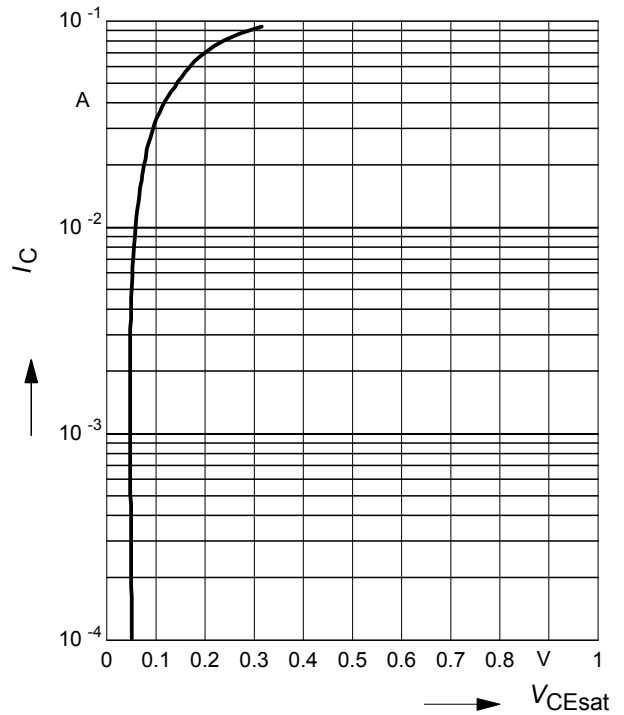
**DC current gain  $h_{FE} = f(I_C)$**

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



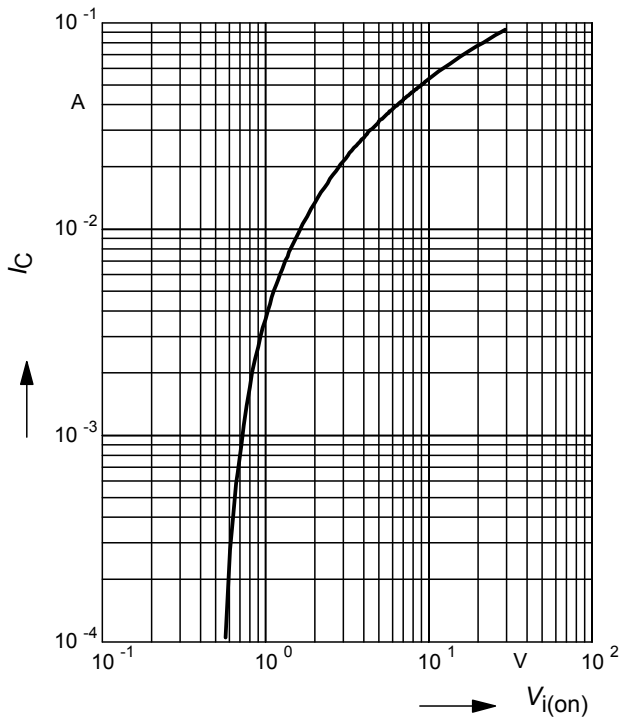
**Collector-emitter saturation voltage**

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



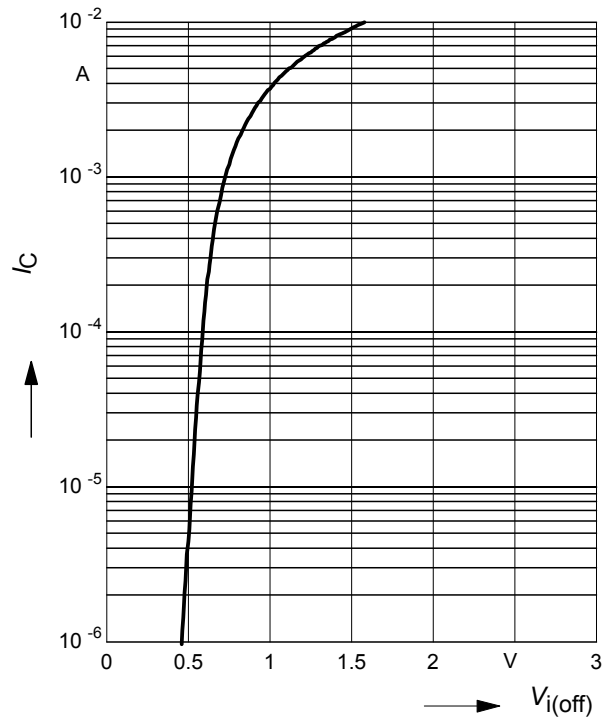
**Input on Voltage  $V_{i(on)} = f(I_C)$**

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



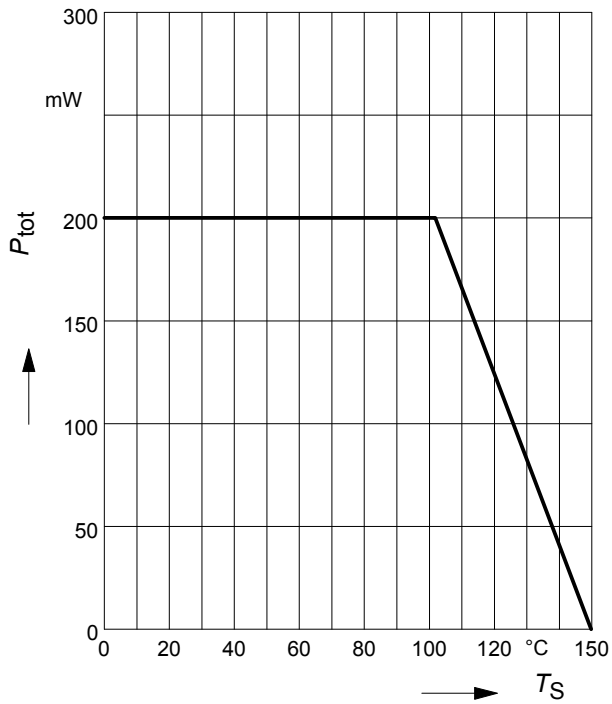
**Input off voltage  $V_{i(off)} = f(I_C)$**

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



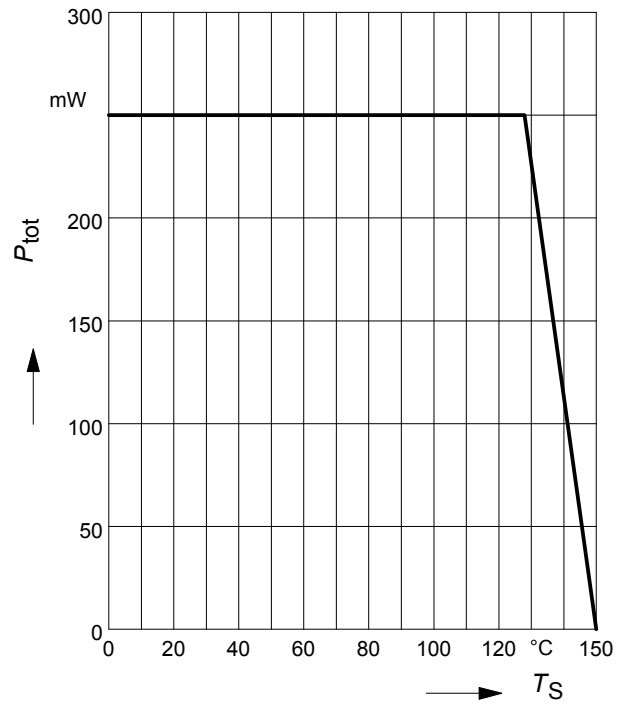
Total power dissipation  $P_{tot} = f(T_S)$

BCR139



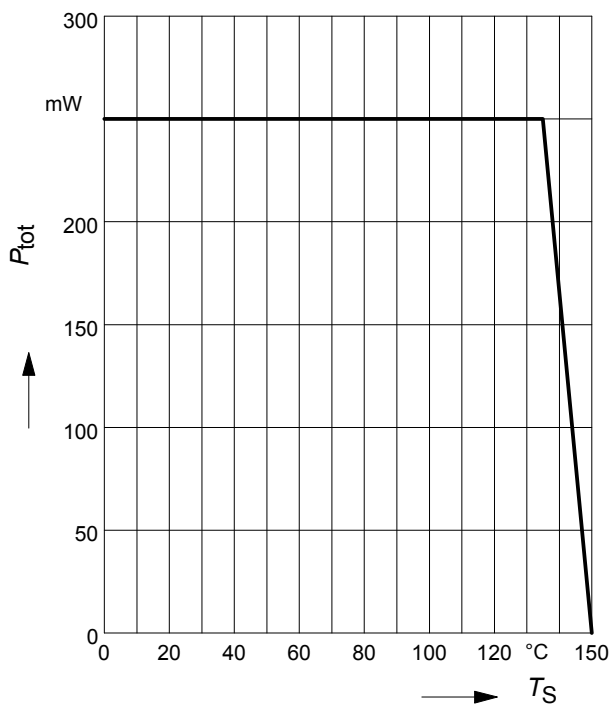
Total power dissipation  $P_{tot} = f(T_S)$

BCR139F



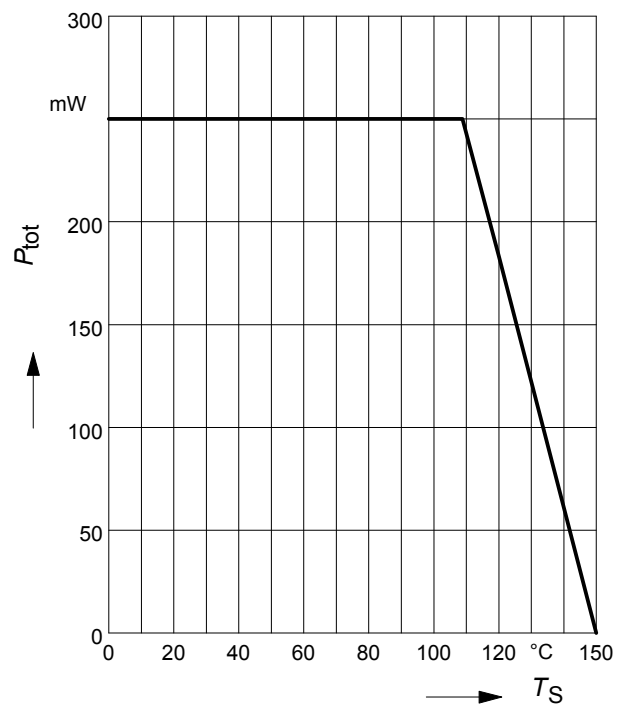
Total power dissipation  $P_{tot} = f(T_S)$

BCR139L3



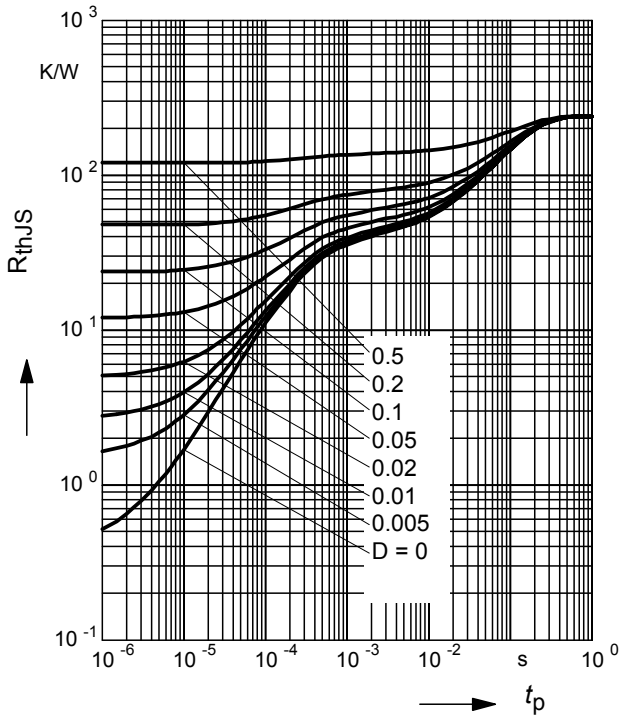
Total power dissipation  $P_{tot} = f(T_S)$

BCR139T



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

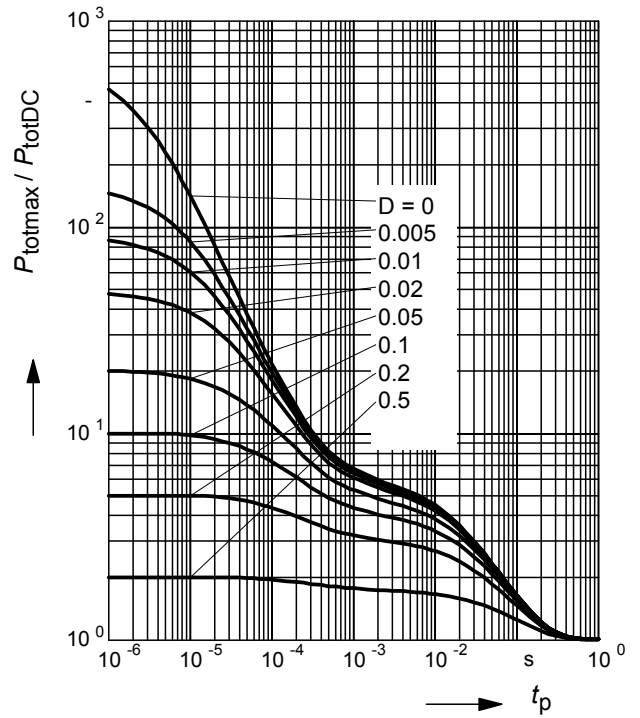
BCR139



**Permissible Pulse Load**

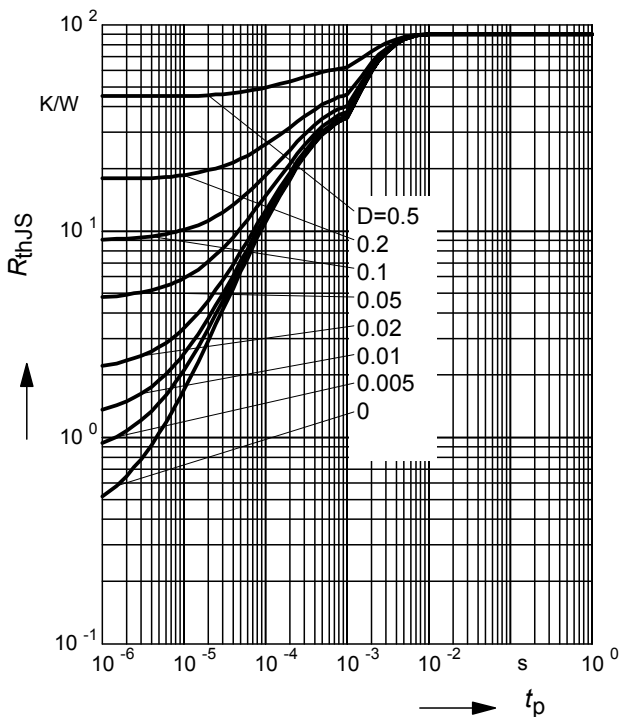
$P_{totmax}/P_{totDC} = f(t_p)$

BCR139



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

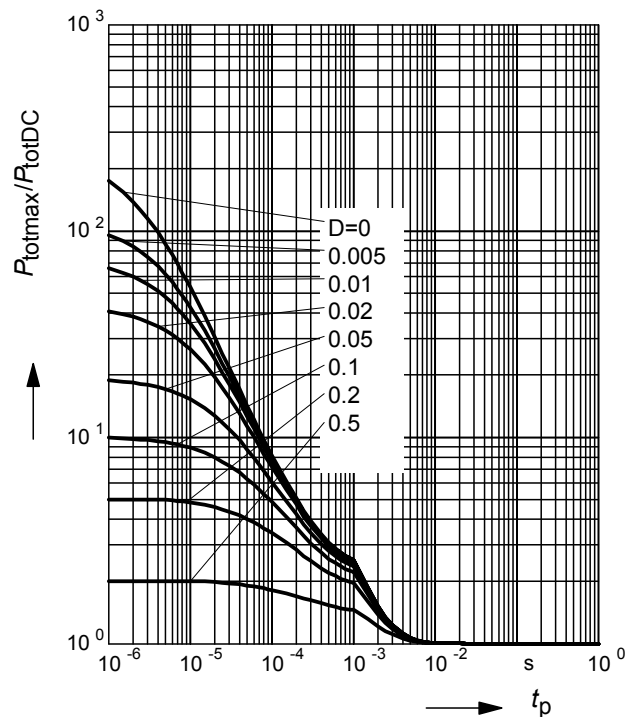
BCR139F



**Permissible Pulse Load**

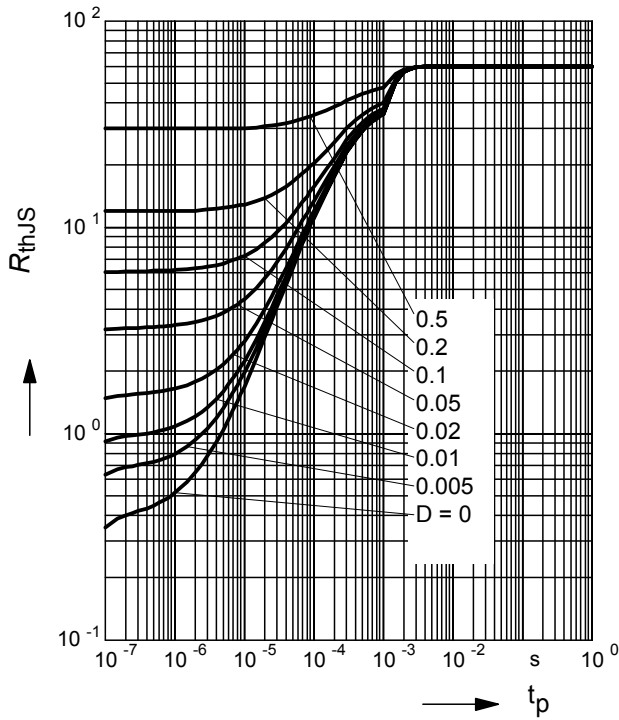
$P_{totmax}/P_{totDC} = f(t_p)$

BCR139F



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

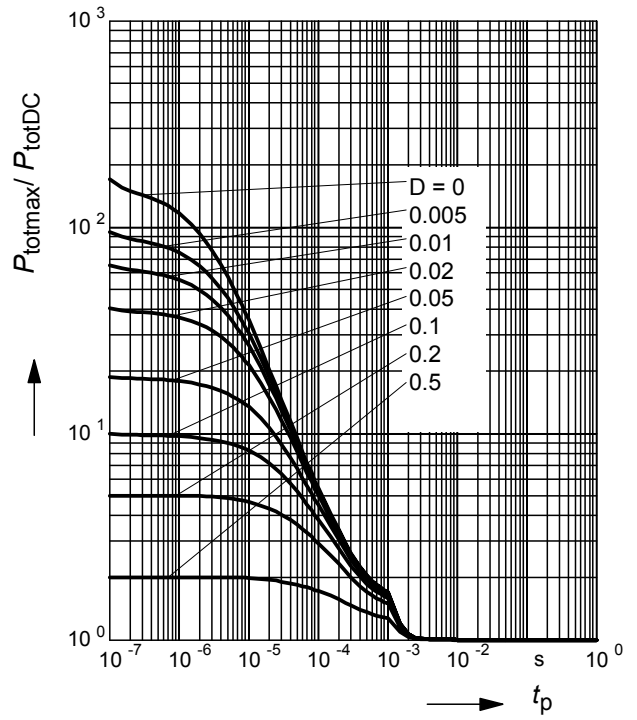
BCR139L3



**Permissible Pulse Load**

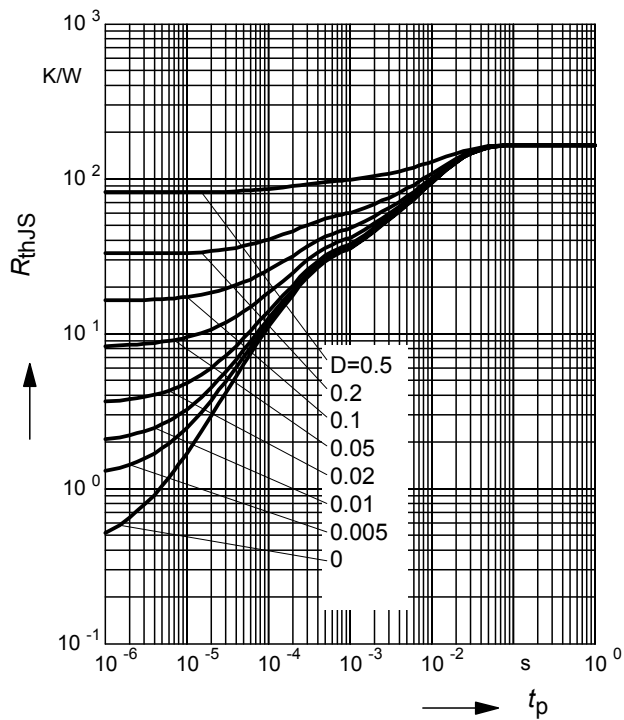
$P_{totmax}/P_{totDC} = f(t_p)$

BCR139L3



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

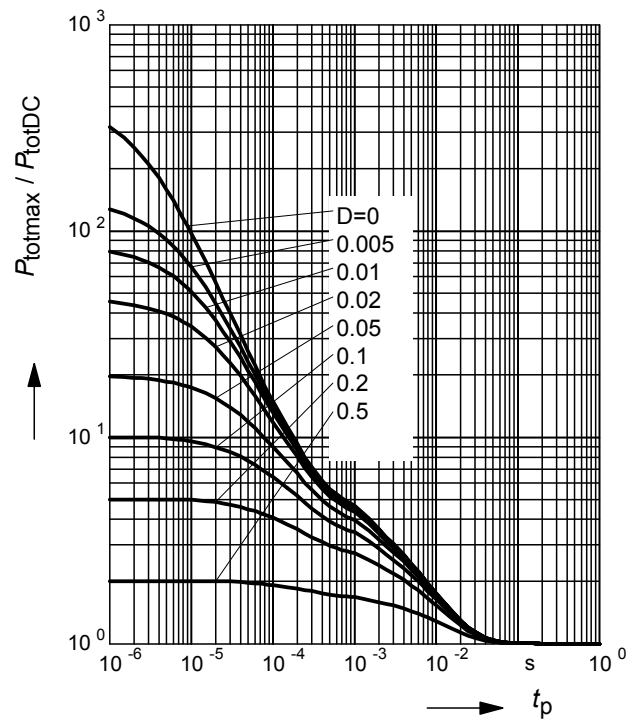
BCR139T



**Permissible Pulse Load**

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

BCR139T



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