

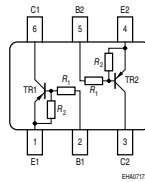
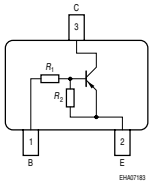
**PNP Silicon Digital Transistor**

- Switching circuit, inverter, interface circuit, driver circuit
- Built in bias resistor ( $R_1=2.2k\Omega$ ,  $R_2=47k\Omega$ )
- For 6-PIN packages: two (galvanic) internal isolated transistors with good matching in one package



**BCR158/F/L3  
BCR158T/W**

**SEMB10**



Type	Marking	Pin Configuration						Package
		1=B	2=E	3=C	-	-	-	
BCR158	WIs	1=B	2=E	3=C	-	-	-	SOT23
BCR158L3	WI	1=B	2=E	3=C	-	-	-	TSFP-3
BCR158F	WIs	1=B	2=E	3=C	-	-	-	TSFP-3
BCR158T	WIs	1=B	2=E	3=C	-	-	-	SC75
BCR158W	WIs	1=B	2=E	3=C	-	-	-	SOT323
SEMB10	W5	1=E1	2=B1	3=C2	4=E2	5=B2	6=C1	SOT666

**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	$V_{i(on)}$	10	
Collector current	$I_C$	100	mA
Total power dissipation- BCR158, $T_S \leq 102^\circ\text{C}$ BCR158F, $T_S \leq 128^\circ\text{C}$ BCR158L3, $T_S \leq 135^\circ\text{C}$ BCR158T, $T_S \leq 109^\circ\text{C}$ BCR158W, $T_S \leq 124^\circ\text{C}$ SEMB10, $T_S \leq 75^\circ\text{C}$	$P_{tot}$	200 250 250 250 250 250	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
BCR158		$\leq 240$	
BCR158F		$\leq 90$	
BCR158L3		$\leq 60$	
BCR158T		$\leq 165$	
BCR158W		$\leq 105$	
SEMB10		$\leq 300$	

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

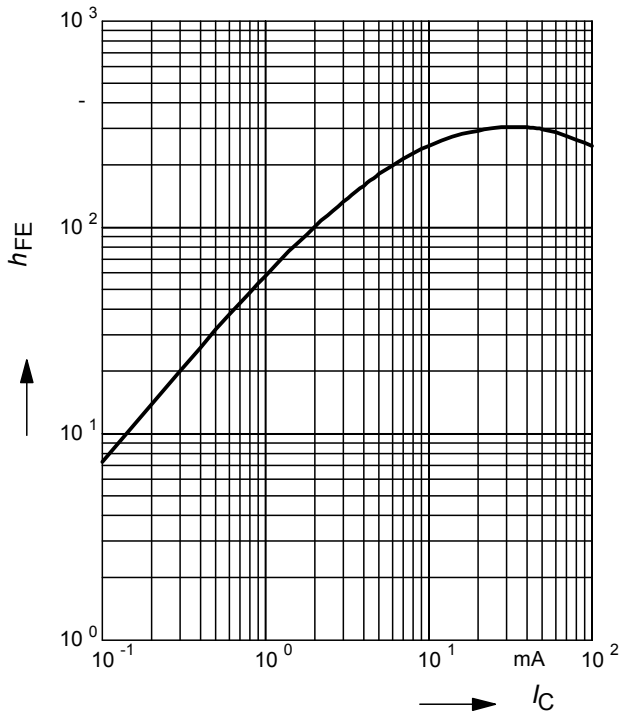
**Electrical Characteristics at  $T_A = 25^\circ\text{C}$ , unless otherwise specified**

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 $V_{EB} = 5 \text{ V}, I_C = 0$	$I_{EBO}$	-	-	164	$\mu\text{A}$
DC current gain <sup>1)</sup> $I_C = 5 \text{ mA}, V_{CE} = 5 \text{ V}$	$h_{FE}$	70	-	-	-
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	$R_1$	1.5	2.2	2.9	$\text{k}\Omega$
Resistor ratio	$R_1/R_2$	0.042	0.047	0.052	-
<b>AC Characteristics</b>					
Transition frequency $I_C = 10 \text{ mA}, V_{CE} = 5 \text{ V}, f = 100 \text{ MHz}$	$f_T$	-	200	-	MHz
Collector-base capacitance $V_{CB} = 10 \text{ V}, f = 1 \text{ MHz}$	$C_{cb}$	-	3	-	pF

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

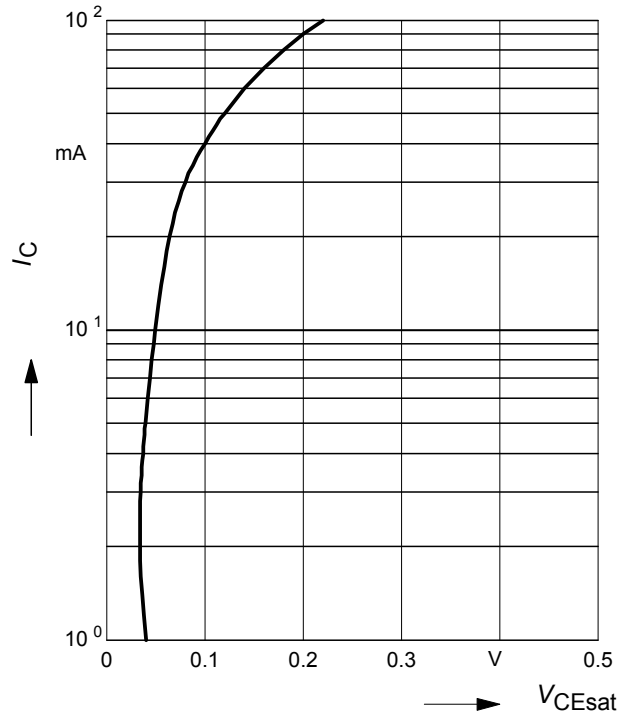
**DC current gain  $h_{FE} = f(I_C)$**

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



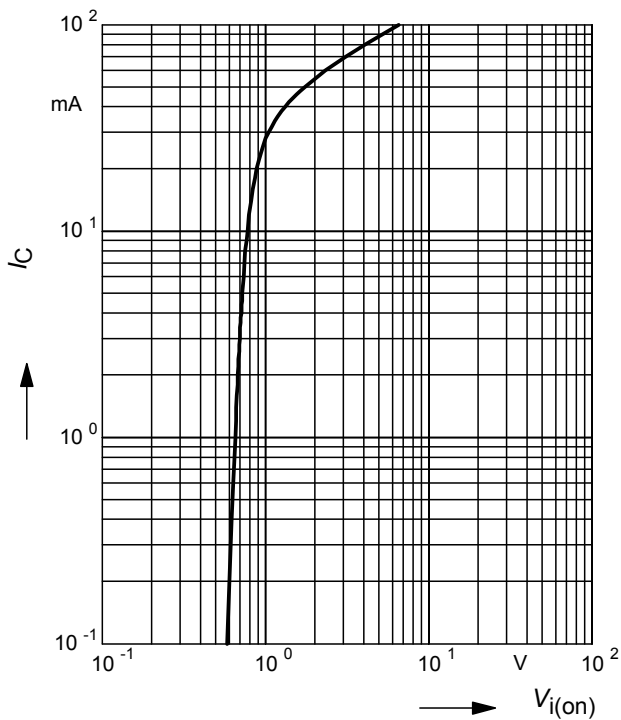
**Collector-emitter saturation voltage**

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



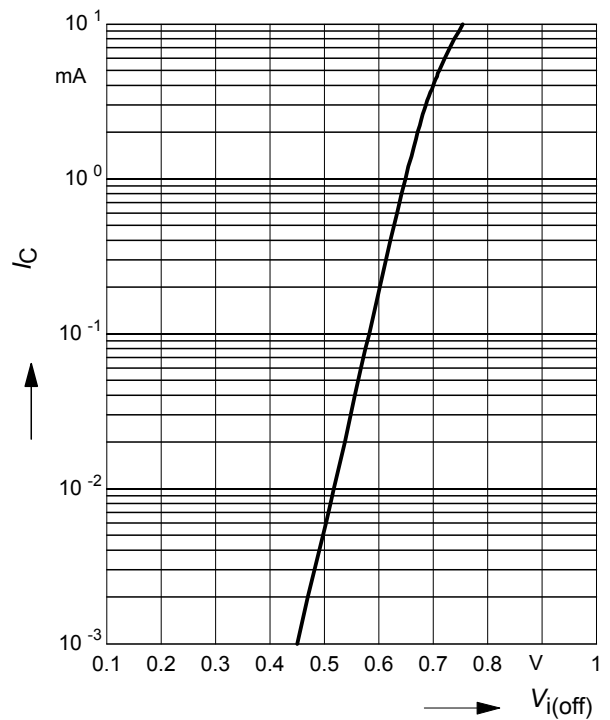
**Input on Voltage  $V_{i(on)} = f(I_C)$**

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



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

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



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

BCR158



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

BCR158F



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

BCR158L3



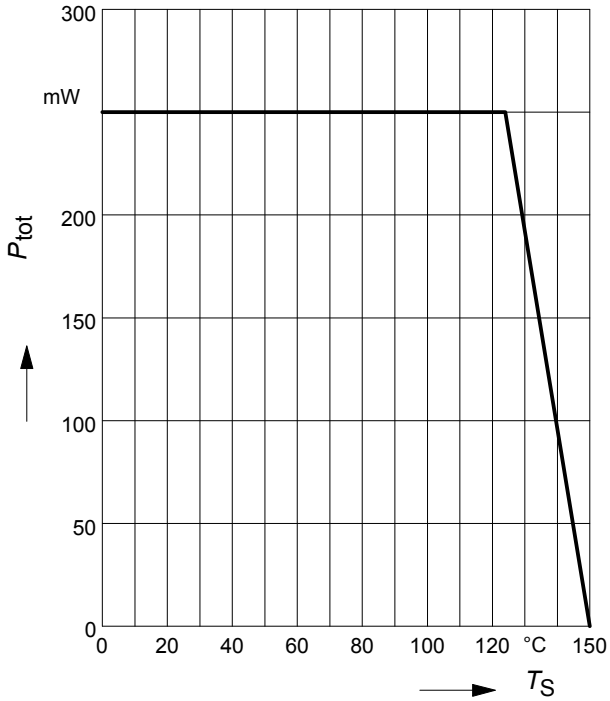
Total power dissipation  $P_{tot} = f(T_S)$

BCR158T



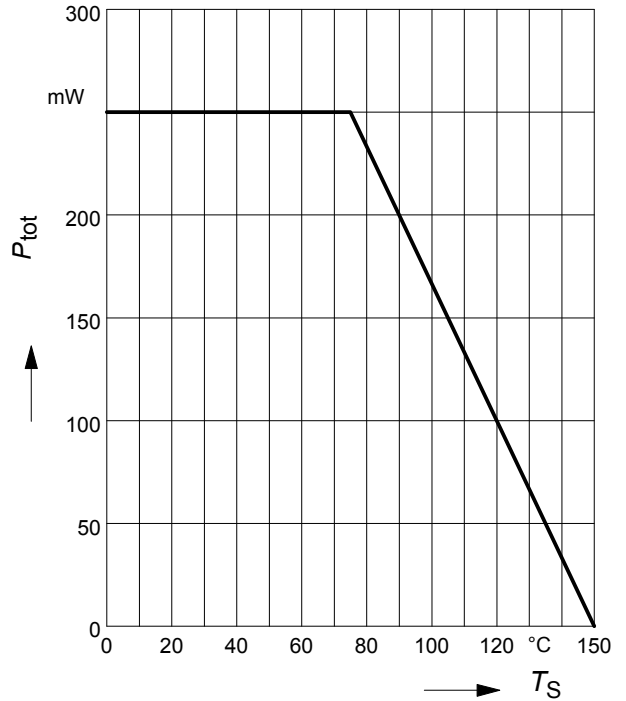
**Total power dissipation  $P_{tot} = f(T_S)$**

BCR158W



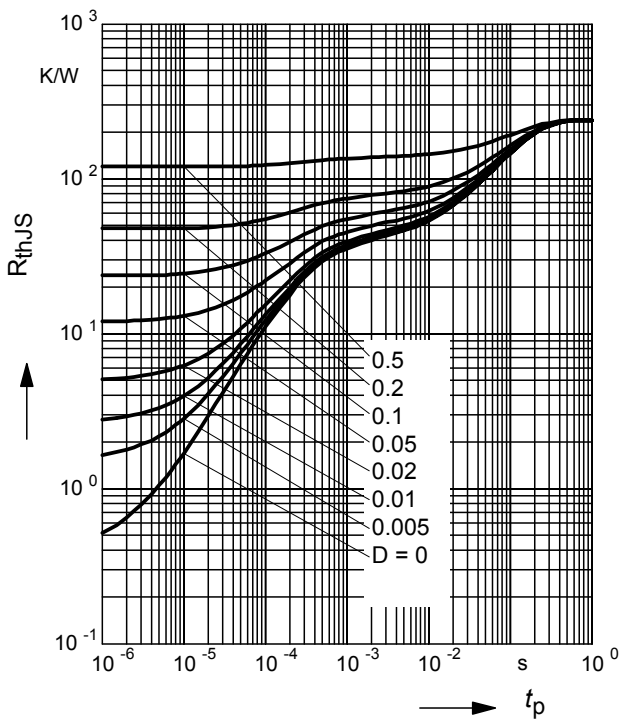
**Total power dissipation  $P_{tot} = f(T_S)$**

SEMB10



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

BCR158



**Permissible Pulse Load**

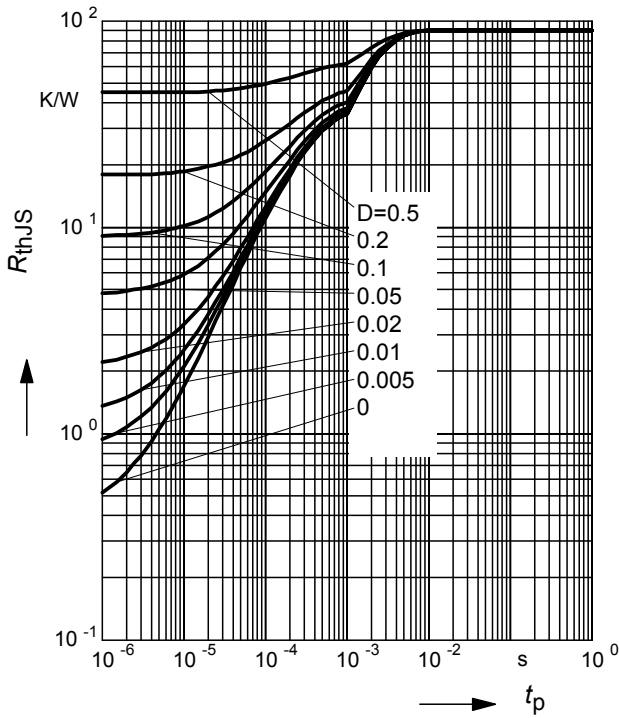
$P_{totmax}/P_{totDC} = f(t_p)$

BCR158



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

BCR158F



**Permissible Pulse Load**

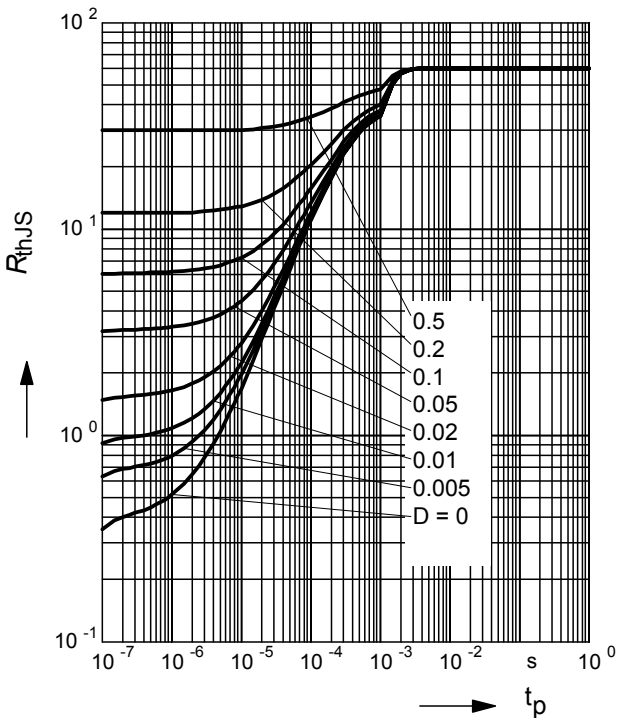
$P_{totmax}/P_{totDC} = f(t_p)$

BCR158F



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

BCR158L3



**Permissible Pulse Load**

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

BCR158L3



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

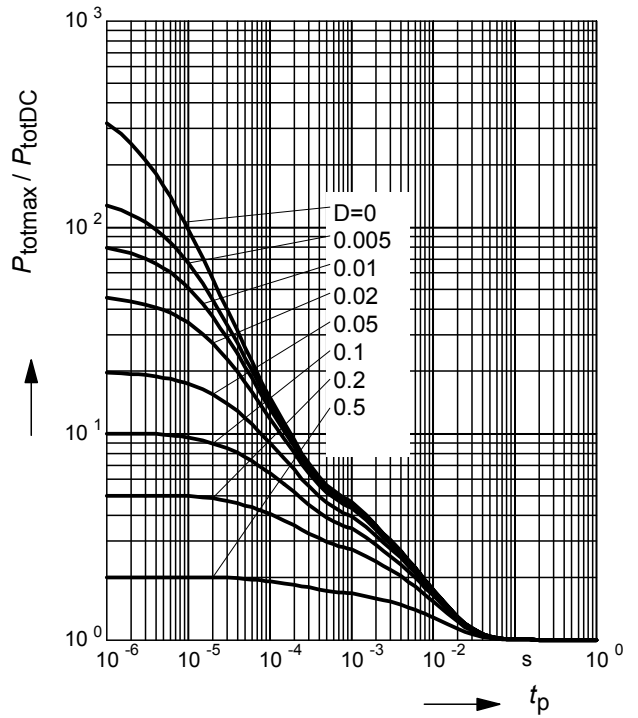
BCR158T



**Permissible Pulse Load**

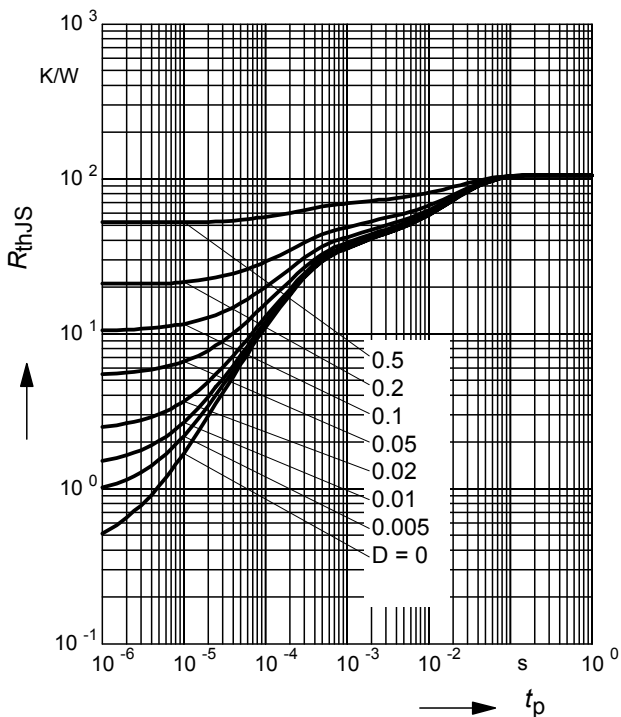
$P_{totmax}/P_{totDC} = f(t_p)$

BCR158T



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

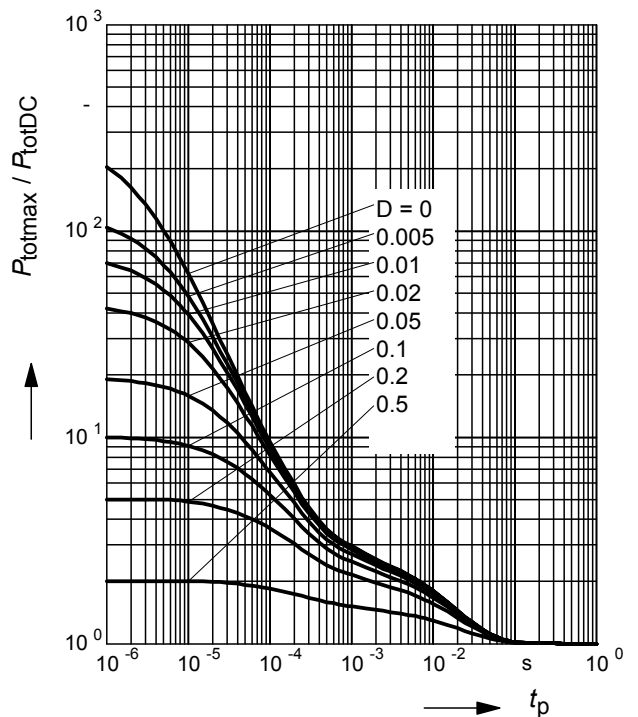
BCR158W



**Permissible Pulse Load**

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

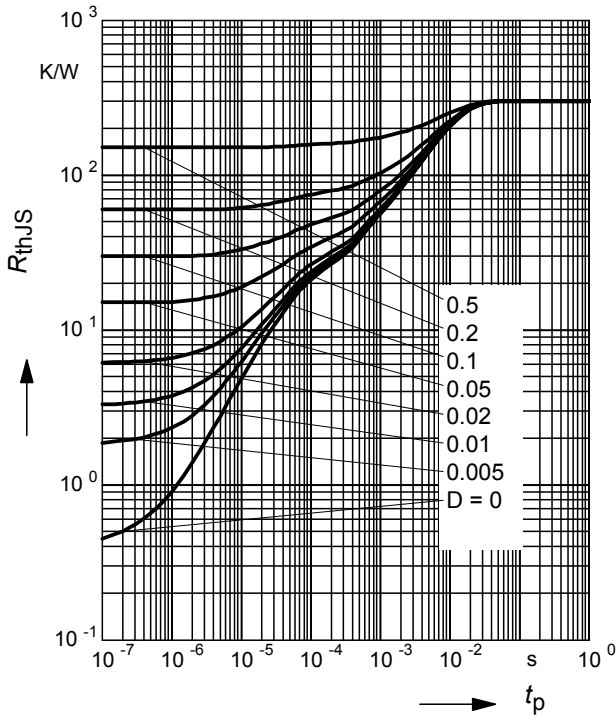
BCR158W





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

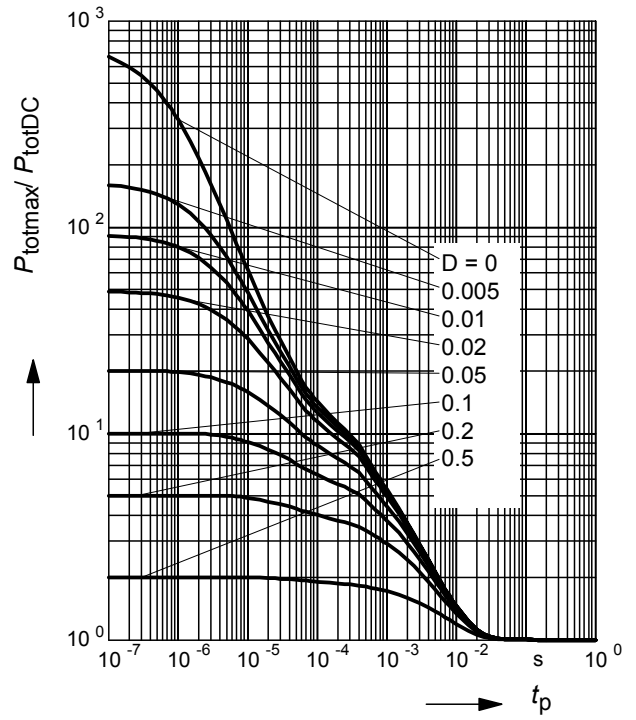
SEMB10



**Permissible Pulse Load**

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

SEMB10



**Published by Infineon Technologies AG,  
St.-Martin-Strasse 53,  
81669 München**

**© Infineon Technologies AG 2004.  
All Rights Reserved.**

**Attention please!**

The information herein is given to describe certain components and shall not be considered as a guarantee of characteristics.

Terms of delivery and rights to technical change reserved.

We hereby disclaim any and all warranties, including but not limited to warranties of non-infringement, regarding circuits, descriptions and charts stated herein.

**Information**

For further information on technology, delivery terms and conditions and prices please contact your nearest Infineon Technologies Office ([www.infineon.com](http://www.infineon.com)).

**Warnings**

Due to technical requirements components may contain dangerous substances. For information on the types in question please contact your nearest Infineon Technologies Office.

Infineon Technologies Components may only be used in life-support devices or systems with the express written approval of Infineon Technologies, if a failure of such components can reasonably be expected to cause the failure of that life-support device or system, or to affect the safety or effectiveness of that device or system. Life support devices or systems are intended to be implanted in the human body, or to support and/or maintain and sustain and/or protect human life. If they fail, it is reasonable to assume that the health of the user or other persons may be endangered.