

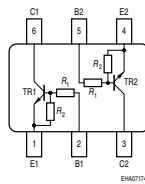
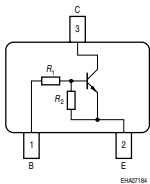
NPN Silicon Digital Transistor

- Switching circuit, inverter, interface circuit, driver circuit
- Built in bias resistor ($R_1=4.7k\Omega$, $R_2=47k\Omega$)
- For 6-PIN packages: two (galvanic) internal isolated transistors with good matching in one package



BCR116/F/L3
BCR116T/W

BCR116S
SEMH13



Type	Marking	Pin Configuration						Package
BCR116	WG _s	1=B	2=E	3=C	-	-	-	SOT23
BCR116F	WG _s	1=B	2=E	3=C	-	-	-	TSFP-3
BCR116L3	WG	1=B	2=E	3=C	-	-	-	TSLP-3-4
BCR116S	WG _s	1=E1	2=B1	3=C2	4=E2	5=B2	6=C1	SOT363
BCR116T	WG _s	1=B	2=E	3=C	-	-	-	SC75
BCR116W	WG _s	1=B	2=E	3=C	-	-	-	SOT323
SEMH13	WG	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	$V_{I(on)}$	15	
Collector current	I_C	100	mA
Total power dissipation- BCR116, $T_S \leq 102^\circ\text{C}$ BCR116F, $T_S \leq 128^\circ\text{C}$ BCR116L3, $T_S \leq 135^\circ\text{C}$ BCR116S, $T_S \leq 115^\circ\text{C}$ BCR116T, $T_S \leq 109^\circ\text{C}$ BCR116W, $T_S \leq 124^\circ\text{C}$ SEMH13, $T_S \leq 75^\circ\text{C}$	P_{tot}	200 250 250 250 250 250 250	mW
Junction temperature	T_j	150	$^\circ\text{C}$
Storage temperature	T_{stg}	-65 ... 150	

Thermal Resistance

Parameter	Symbol	Value	Unit
Junction - soldering point ¹⁾	R_{thJS}		K/W
BCR116		≤ 240	
BCR116F		≤ 90	
BCR116L3		≤ 60	
BCR116S		≤ 140	
BCR116T		≤ 165	
BCR116W		≤ 105	
SEMH13		≤ 300	

¹⁾For calculation of R_{thJA} please refer to Application Note Thermal Resistance

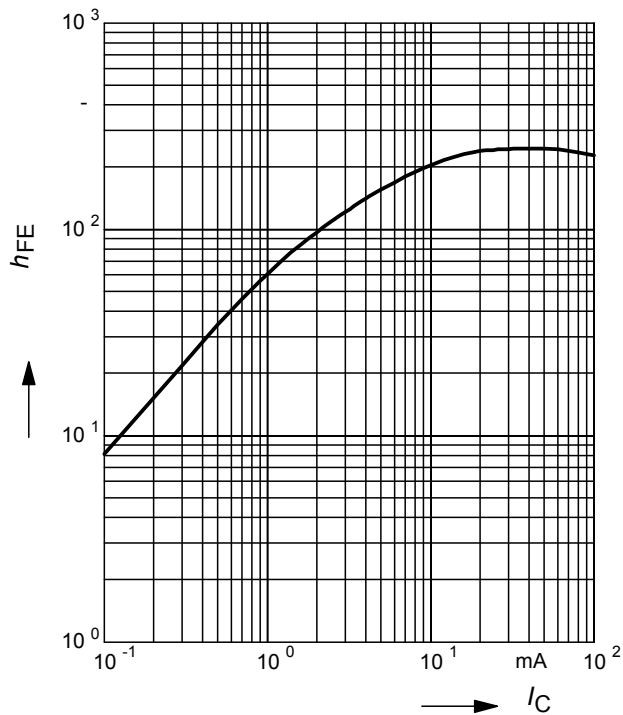
Electrical Characteristics at $T_A = 25^\circ\text{C}$, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
DC Characteristics					
Collector-emitter breakdown voltage $I_C = 100\ \mu\text{A}$, $I_B = 0$	$V_{(\text{BR})\text{CEO}}$	50	-	-	V
Collector-base breakdown voltage $I_C = 10\ \mu\text{A}$, $I_E = 0$	$V_{(\text{BR})\text{CBO}}$	50	-	-	
Collector-base cutoff current $V_{\text{CB}} = 40\ \text{V}$, $I_E = 0$	I_{CBO}	-	-	100	nA
Emitter-base cutoff current $V_{\text{EB}} = 5\ \text{V}$, $I_C = 0$	I_{EBO}	-	-	155	μA
DC current gain ¹⁾ $I_C = 5\ \text{mA}$, $V_{\text{CE}} = 5\ \text{V}$	h_{FE}	70	-	-	-
Collector-emitter saturation voltage ¹⁾ $I_C = 10\ \text{mA}$, $I_B = 0.5\ \text{mA}$	V_{CEsat}	-	-	0.3	V
Input off voltage $I_C = 100\ \mu\text{A}$, $V_{\text{CE}} = 5\ \text{V}$	$V_{\text{i(off)}}$	0.4	-	0.8	
Input on voltage $I_C = 2\ \text{mA}$, $V_{\text{CE}} = 0.3\ \text{V}$	$V_{\text{i(on)}}$	0.5	-	1.4	
Input resistor	R_1	3.2	4.7	6.2	k Ω
Resistor ratio	R_1/R_2	0.09	0.1	0.11	-
AC Characteristics					
Transition frequency $I_C = 10\ \text{mA}$, $V_{\text{CE}} = 5\ \text{V}$, $f = 100\ \text{MHz}$	f_{T}	-	150	-	MHz
Collector-base capacitance $V_{\text{CB}} = 10\ \text{V}$, $f = 1\ \text{MHz}$	C_{cb}	-	3	-	pF

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

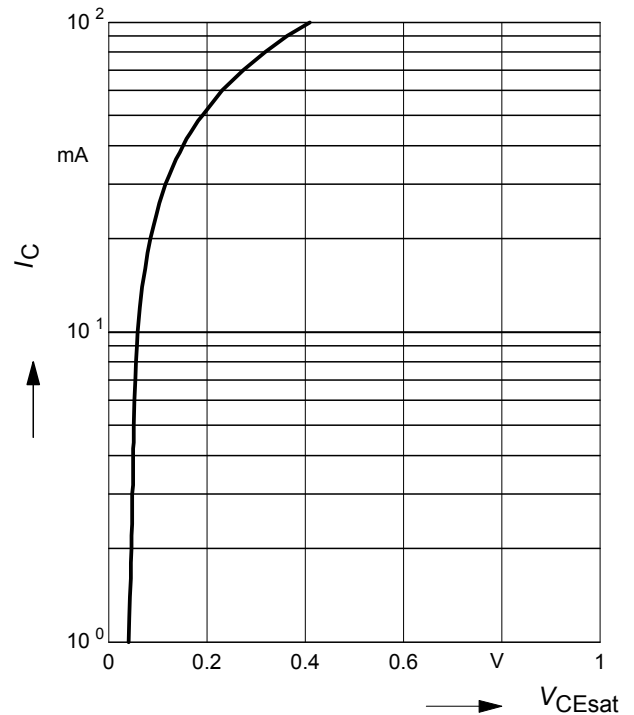
DC current gain $h_{FE} = f(I_C)$

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



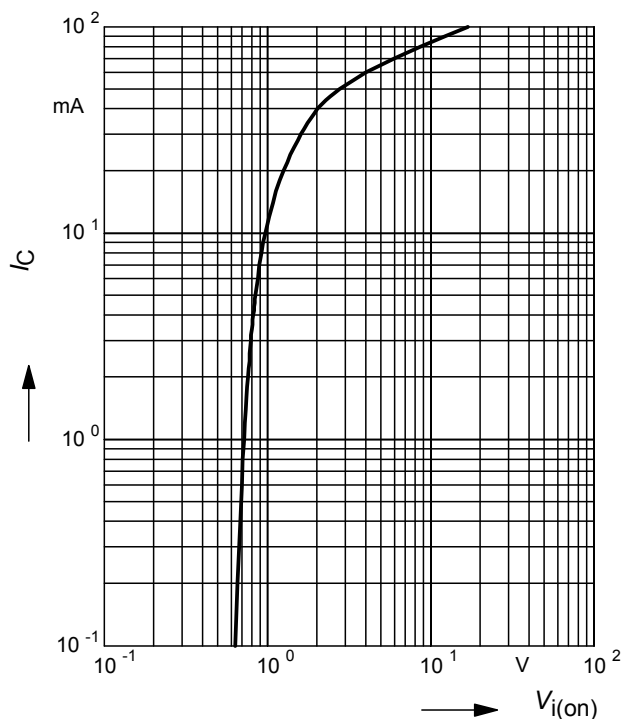
Collector-emitter saturation voltage

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



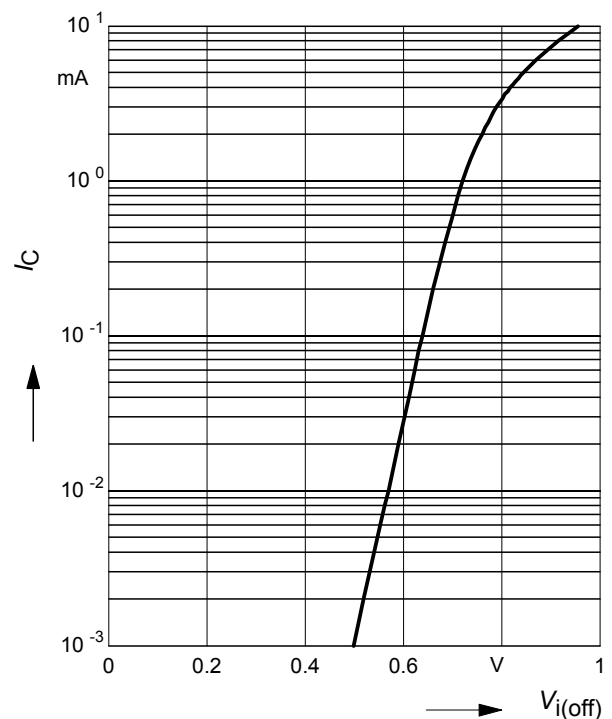
Input on Voltage $V_{i(on)} = f(I_C)$

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



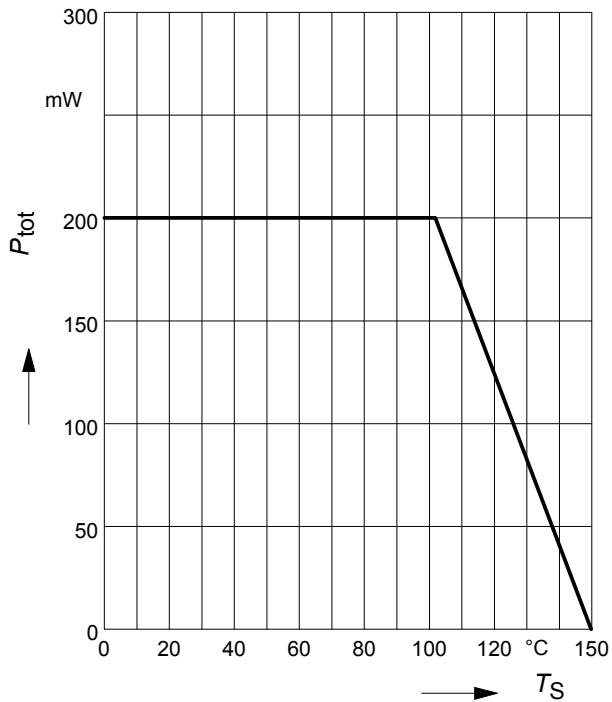
Input off voltage $V_{i(off)} = f(I_C)$

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



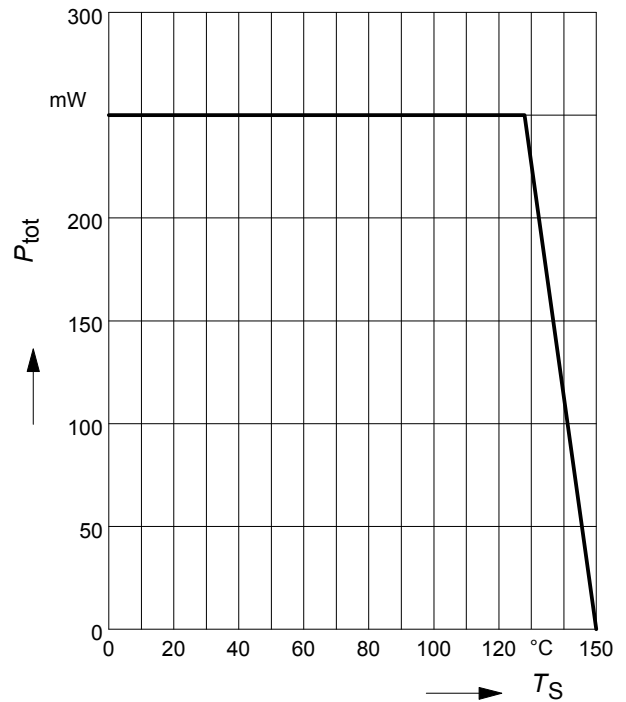
Total power dissipation $P_{\text{tot}} = f(T_S)$

BCR116



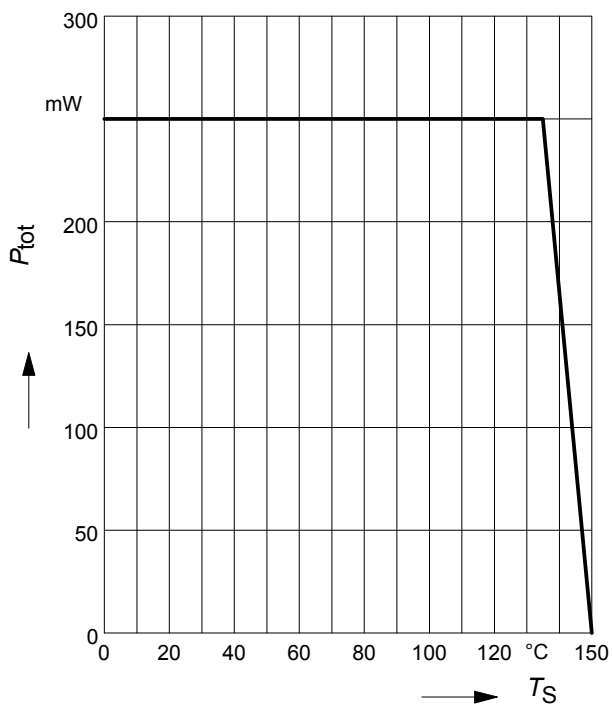
Total power dissipation $P_{\text{tot}} = f(T_S)$

BCR116F



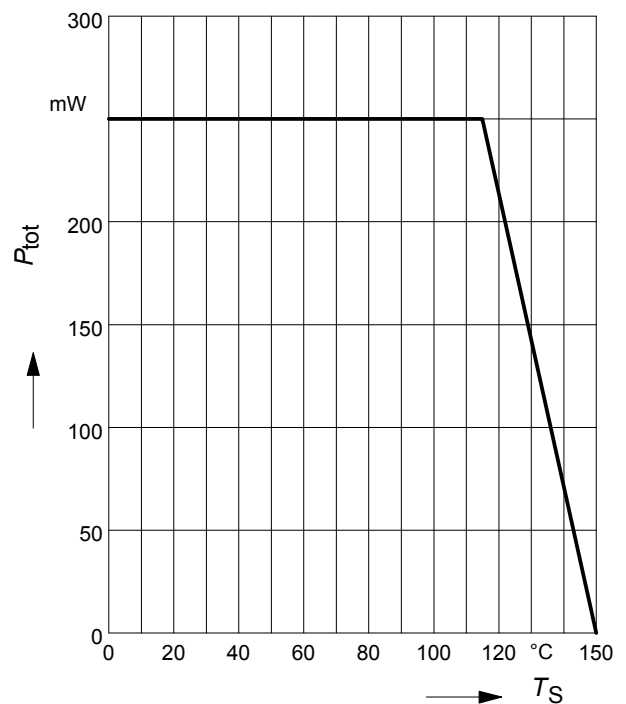
Total power dissipation $P_{\text{tot}} = f(T_S)$

BCR116L3



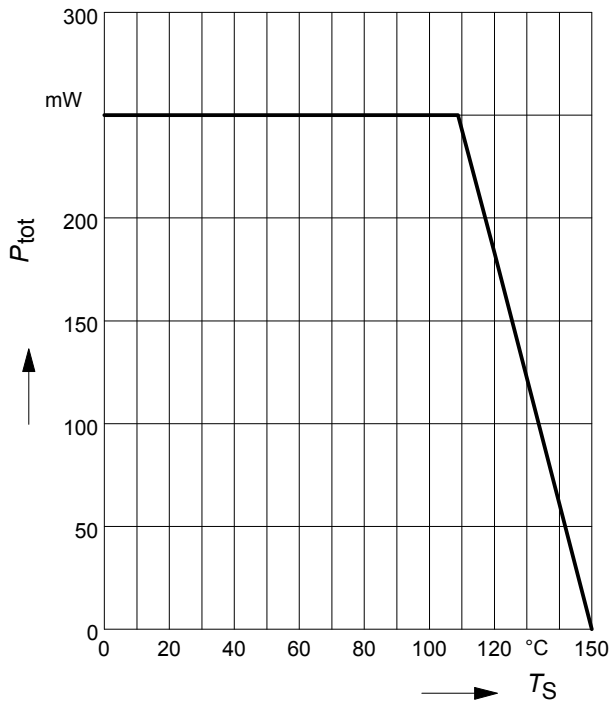
Total power dissipation $P_{\text{tot}} = f(T_S)$

BCR116S



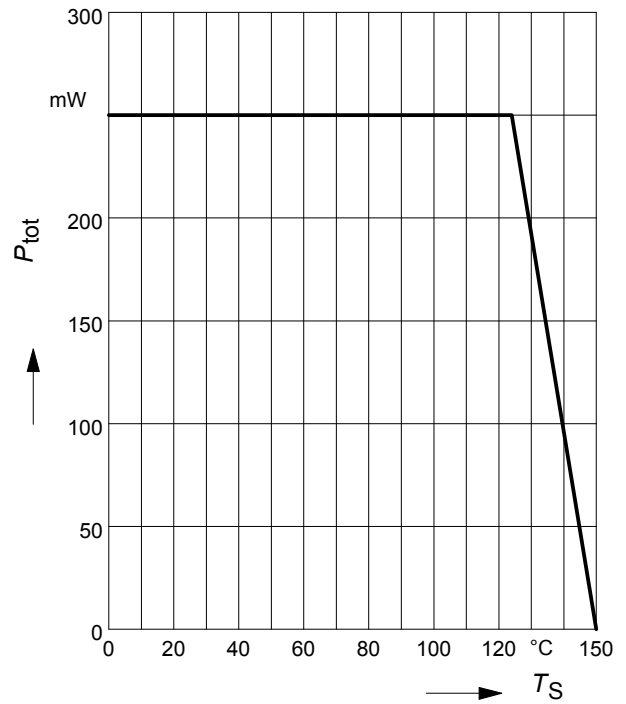
Total power dissipation $P_{\text{tot}} = f(T_S)$

BCR116T



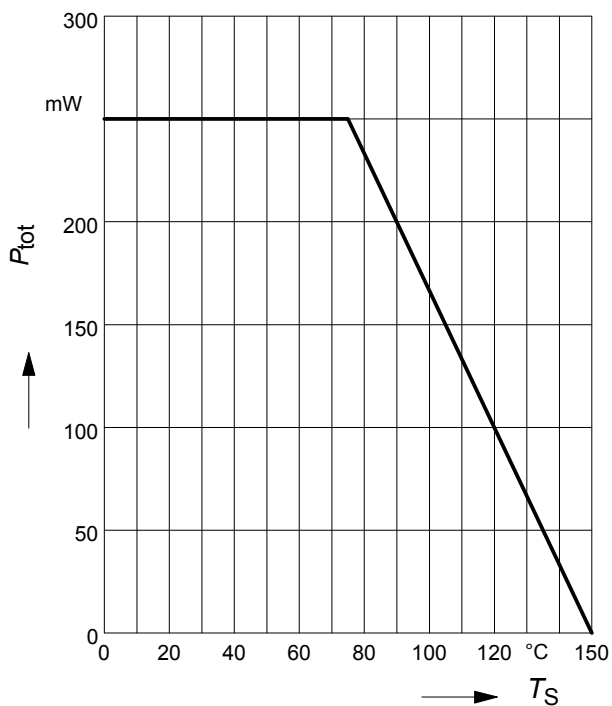
Total power dissipation $P_{\text{tot}} = f(T_S)$

BCR116W



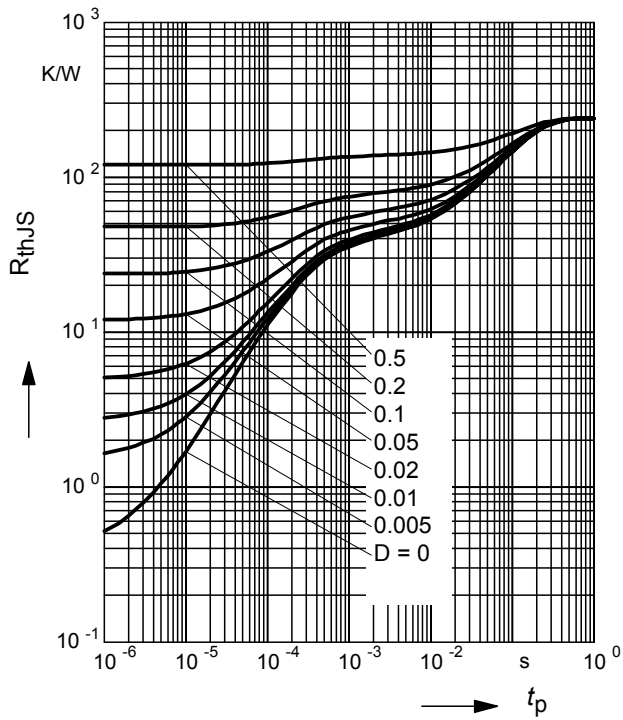
Total power dissipation $P_{\text{tot}} = f(T_S)$

SEMH13



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

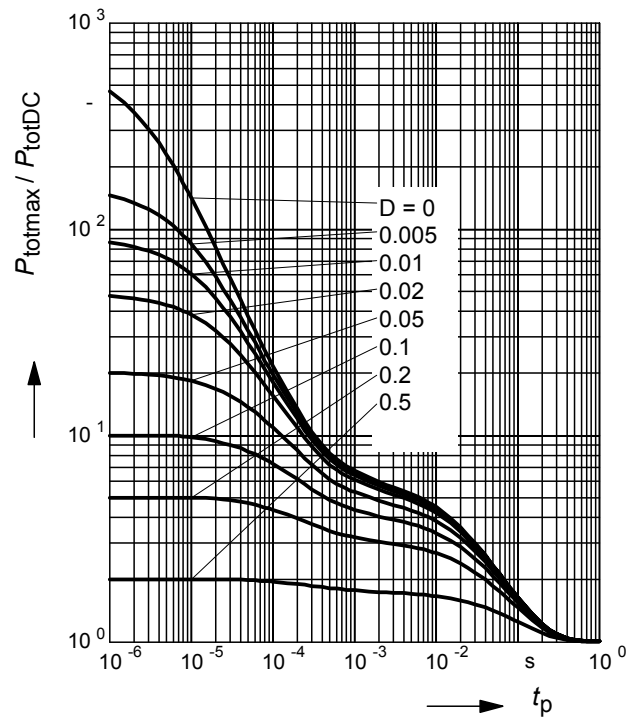
BCR116



Permissible Pulse Load

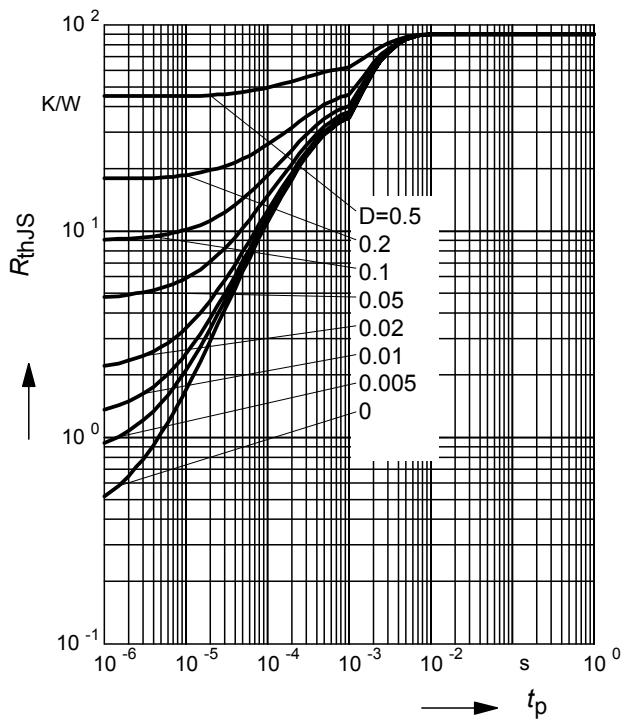
$$P_{totmax}/P_{totDC} = f(t_p)$$

BCR116



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

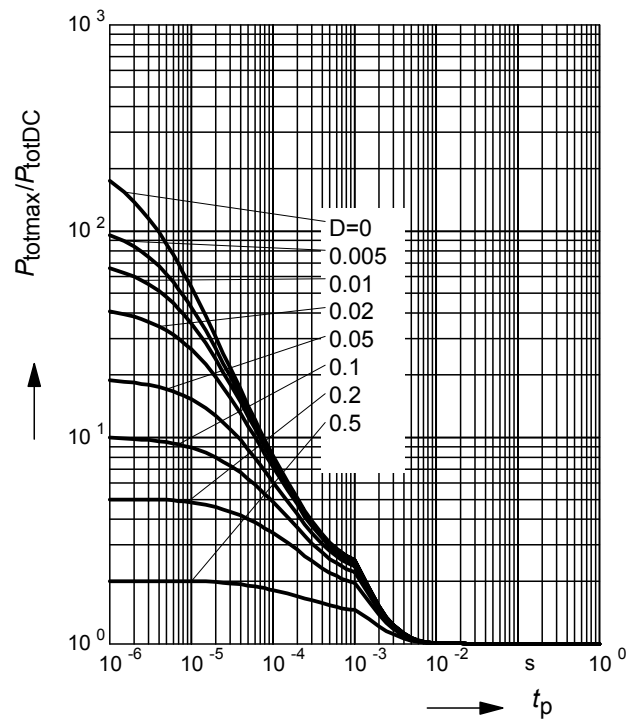
BCR116F



Permissible Pulse Load

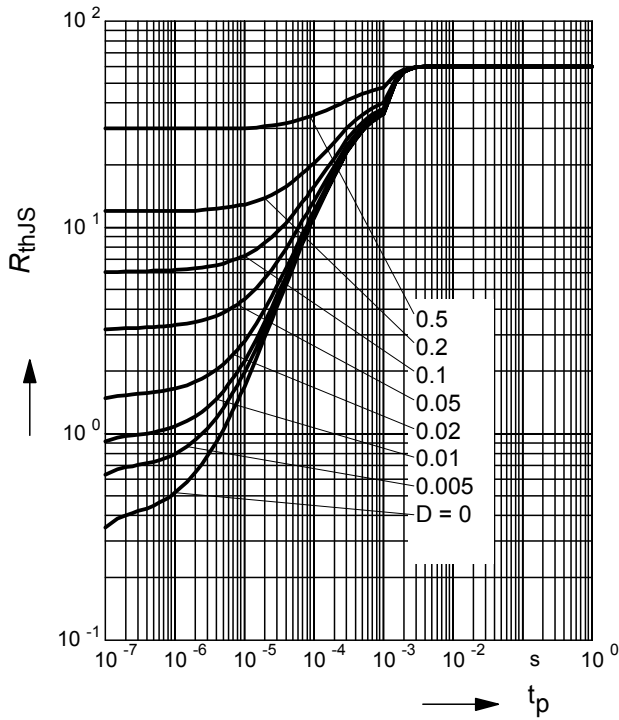
$$P_{totmax}/P_{totDC} = f(t_p)$$

BCR116F



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

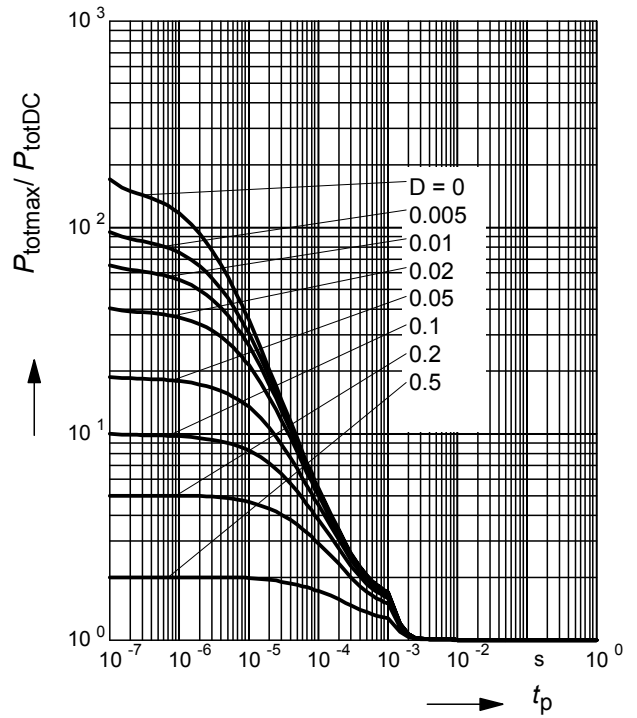
BCR116L3



Permissible Pulse Load

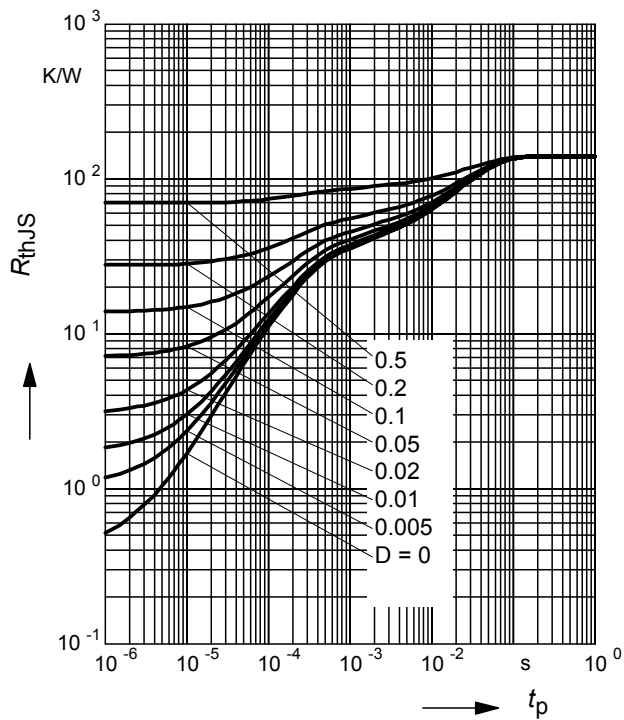
$$P_{totmax}/P_{totDC} = f(t_p)$$

BCR116L3



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

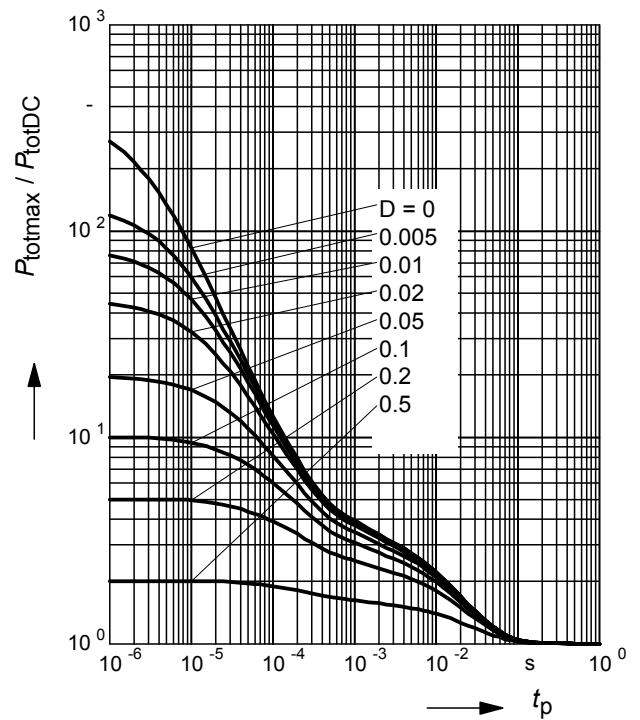
BCR116S



Permissible Pulse Load

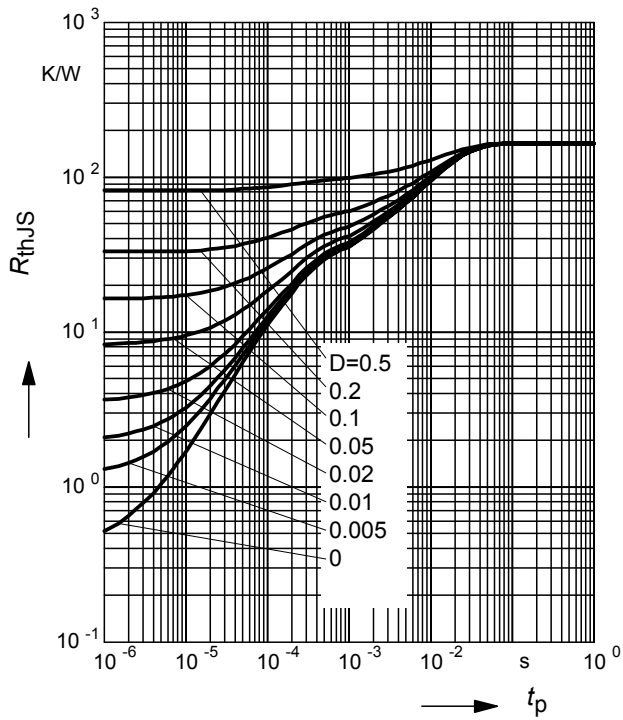
$$P_{totmax}/P_{totDC} = f(t_p)$$

BCR116S



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

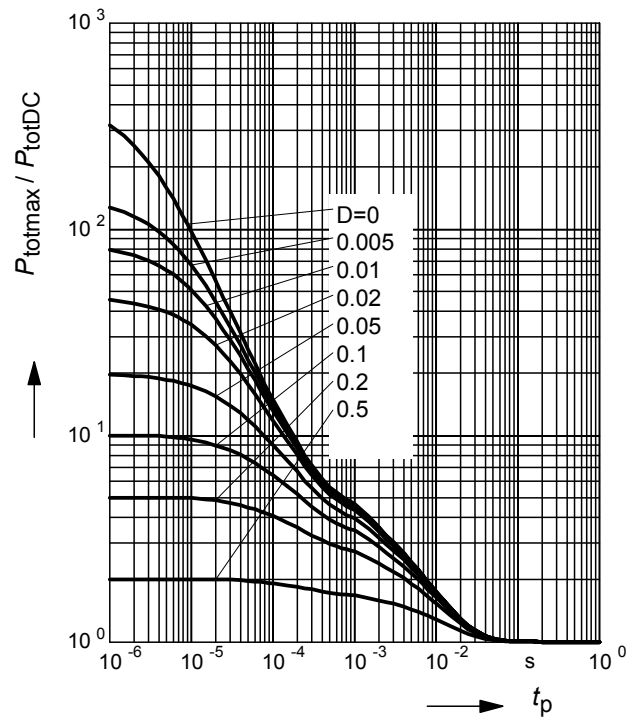
BCR116T



Permissible Pulse Load

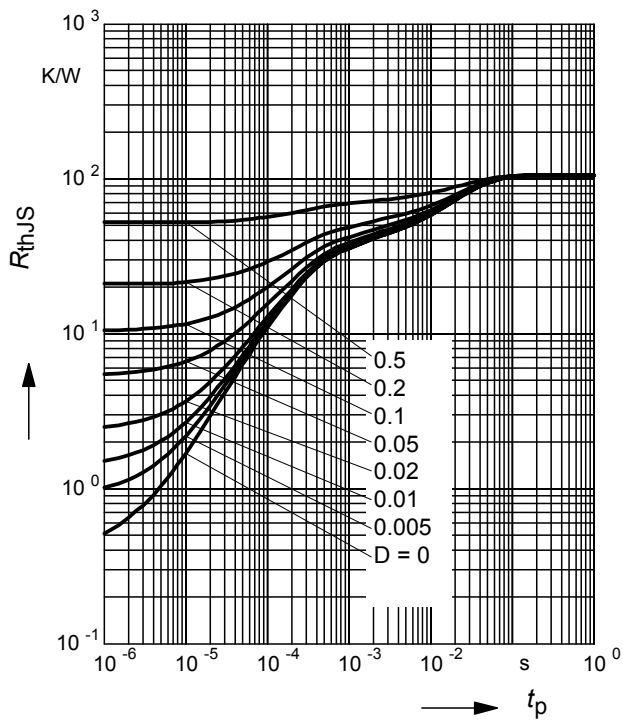
$$P_{totmax}/P_{totDC} = f(t_p)$$

BCR116T



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

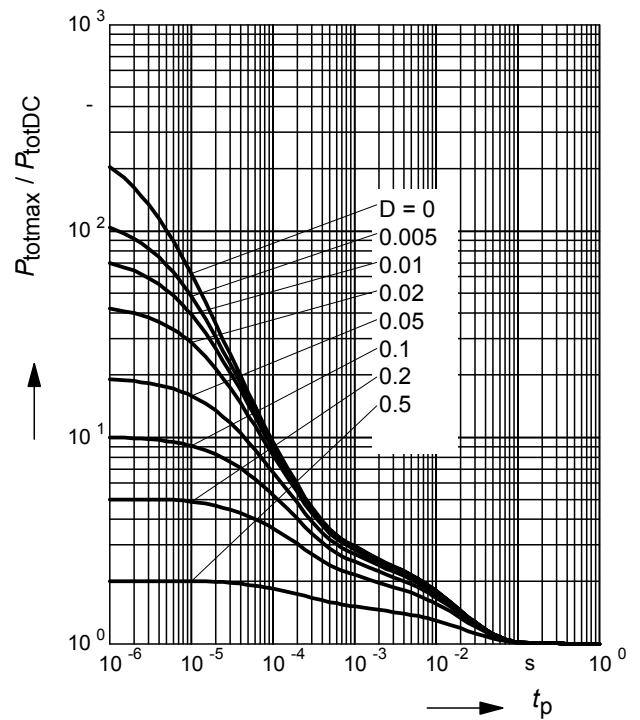
BCR116W



Permissible Pulse Load

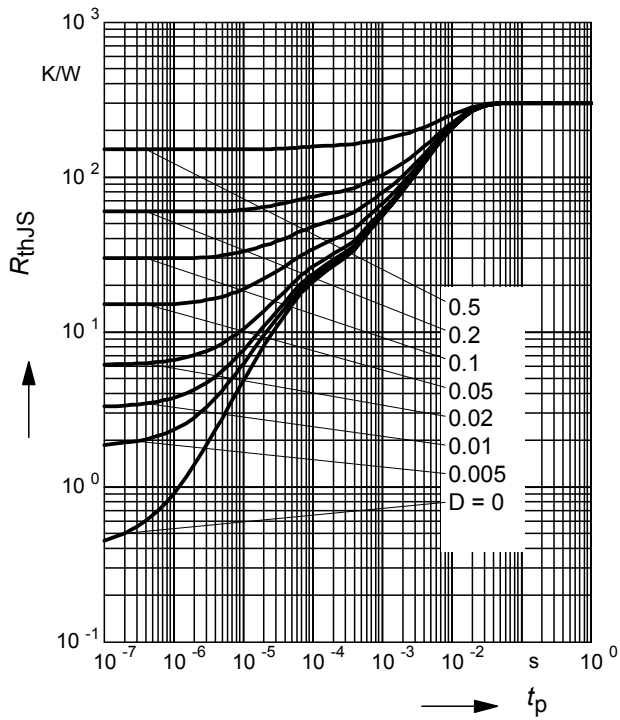
$$P_{totmax}/P_{totDC} = f(t_p)$$

BCR116W



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

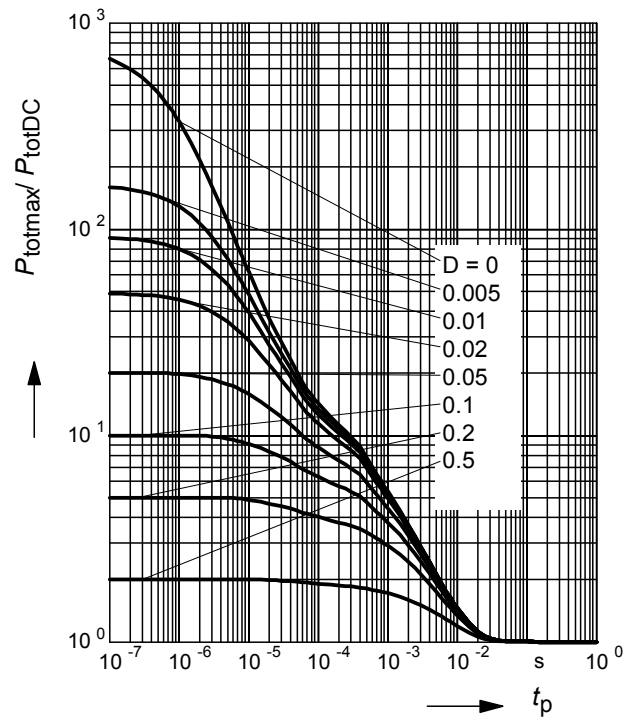
SEMH13



Permissible Pulse Load

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

SEMH13



**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).

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.