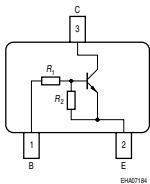


NPN Silicon Digital Transistor

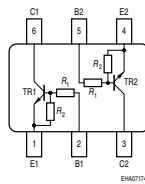
- Switching circuit, inverter, interface circuit driver circuit
- Built in bias resistor ($R_1=10k\Omega$, $R_2=47k\Omega$)
- For 6-PIN packages: two (galvanic) internal isolated transistors with good matching in one package



BCR135/F/L3 BCR135T/W



BCR135S SEMH9



Type	Marking	Pin Configuration						Package
BCR135	WJs	1=B	2=E	3=C	-	-	-	SOT23
BCR135F	WJs	1=B	2=E	3=C	-	-	-	TSFP-3
BCR135L3	WJ	1=B	2=E	3=C	-	-	-	TSLP-3-4
BCR135S	WJs	1=E1	2=B1	3=C2	4=E2	5=B2	6=C1	SOT363
BCR135T	WJs	1=B	2=E	3=C	-	-	-	SC75
BCR135W	WJs	1=B	2=E	3=C	-	-	-	SOT323
SEMH9	WJ	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}	6	
Input on voltage	$V_{i(on)}$	20	
Collector current	I_C	100	mA
Total power dissipation	P_{tot}		mW
BCR135, $T_S \leq 102^\circ\text{C}$		200	
BCR135F, $T_S \leq 128^\circ\text{C}$		250	
BCR135L3, $T_S \leq 135^\circ\text{C}$		250	
BCR135S, $T_S \leq 115^\circ\text{C}$		250	
BCR135T, $T_S \leq 109^\circ\text{C}$		250	
BCR135W, $T_S \leq 124^\circ\text{C}$		250	
SEMH9, $T_S \leq 75^\circ\text{C}$		250	
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
BCR135		≤ 240	
BCR135F		≤ 90	
BCR135L3		≤ 60	
BCR135S		≤ 140	
BCR135T		≤ 165	
BCR135W		≤ 105	
SEMH9		≤ 300	

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

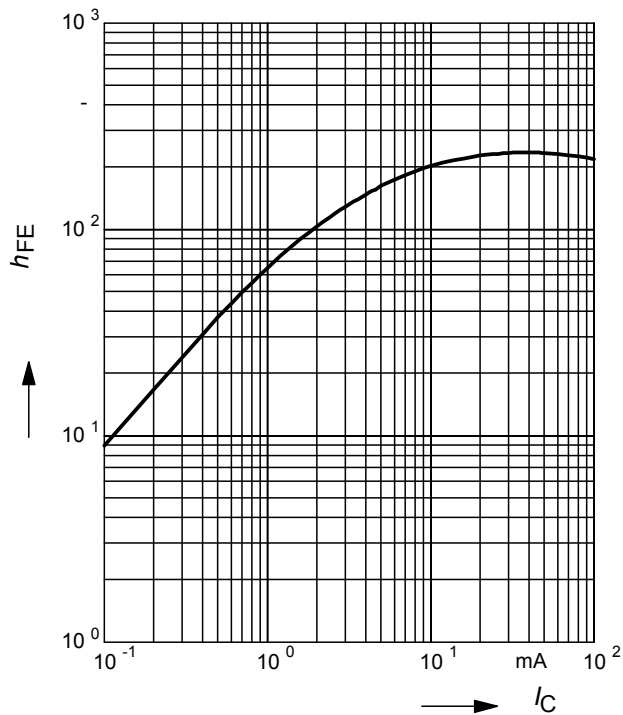
Electrical Characteristics at $T_A = 25^\circ\text{C}$, unless otherwise specified

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 $V_{\text{EB}} = 6\ \text{V}$, $I_C = 0$	I_{EBO}	-	-	167	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 $I_C = 100\ \mu\text{A}$, $V_{\text{CE}} = 5\ \text{V}$	$V_{\text{i(off)}}$	0.5	-	1	
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	7	10	13	k Ω
Resistor ratio	R_1/R_2	0.19	0.21	0.24	-
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: $t < 300\ \mu\text{s}$; $D < 2\%$

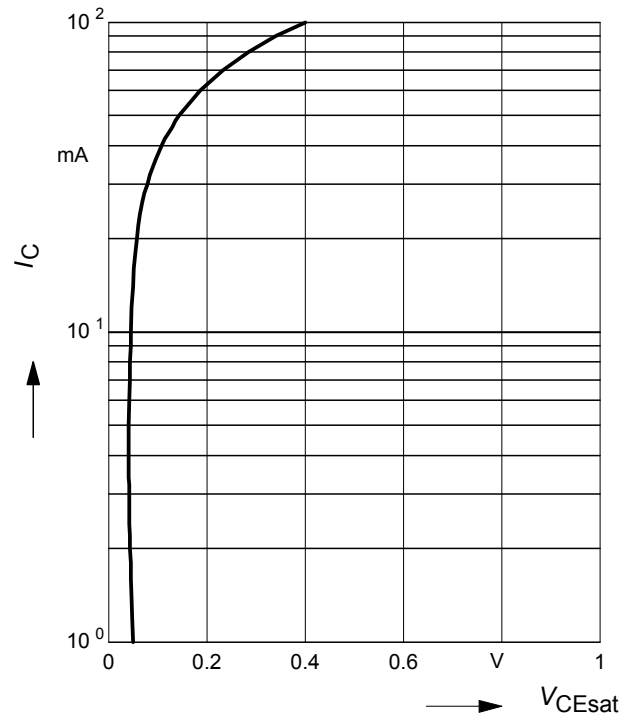
DC current gain $h_{FE} = f(I_C)$

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



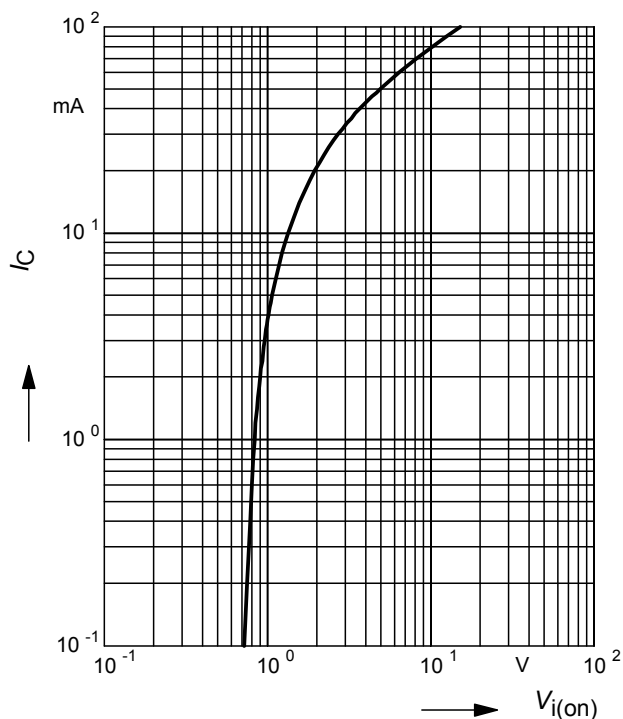
Collector-emitter saturation voltage

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



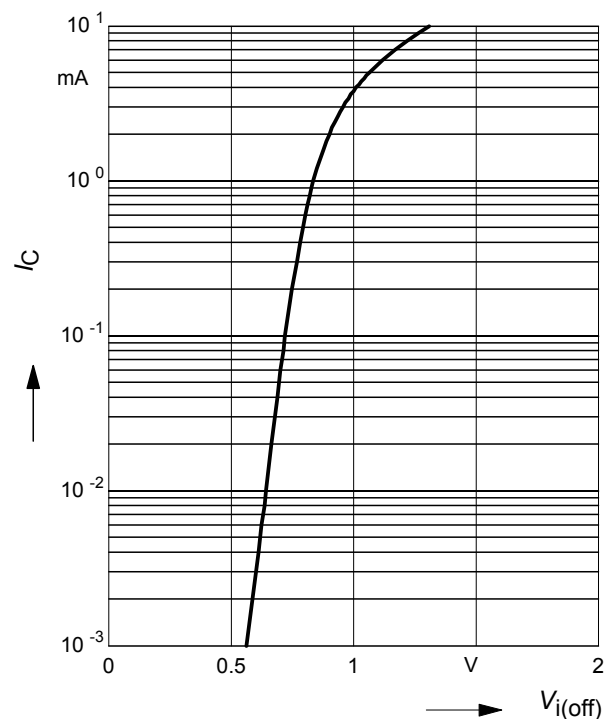
Input on Voltage $V_{i(on)} = f(I_C)$

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



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

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



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

BCR135



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

BCR135F



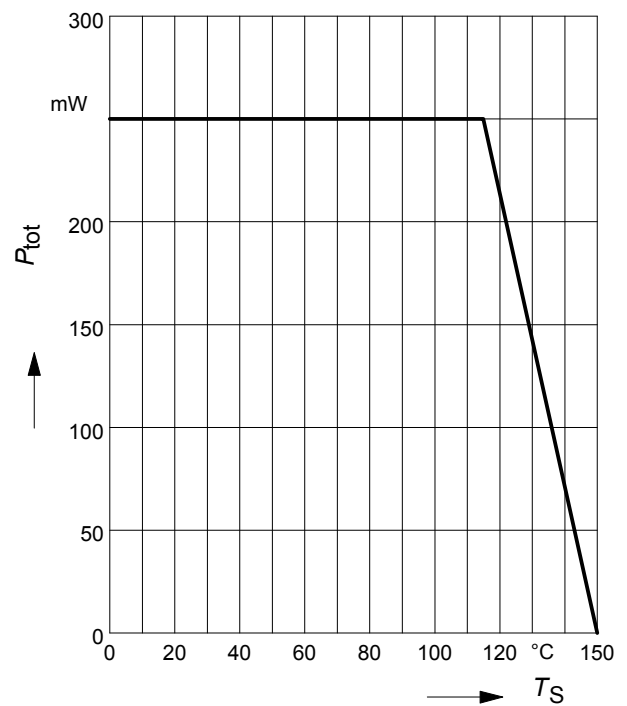
Total power dissipation $P_{\text{tot}} = f(T_S)$

BCR135L3



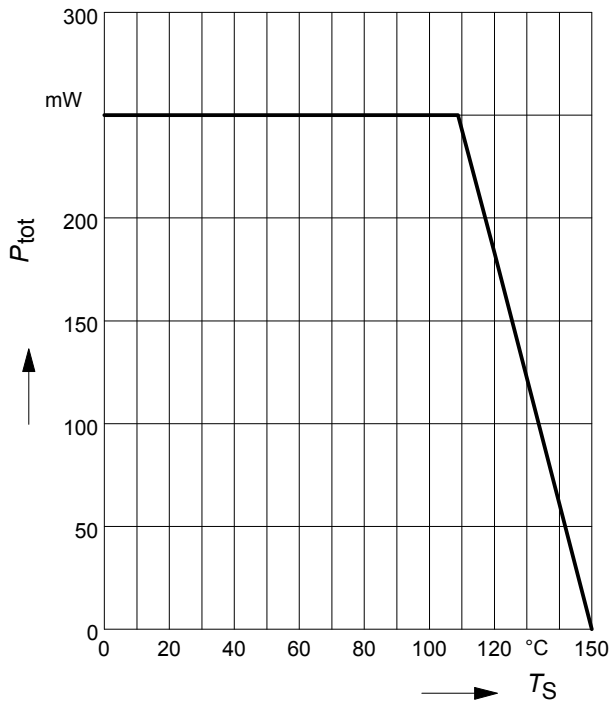
Total power dissipation $P_{\text{tot}} = f(T_S)$

BCR135S



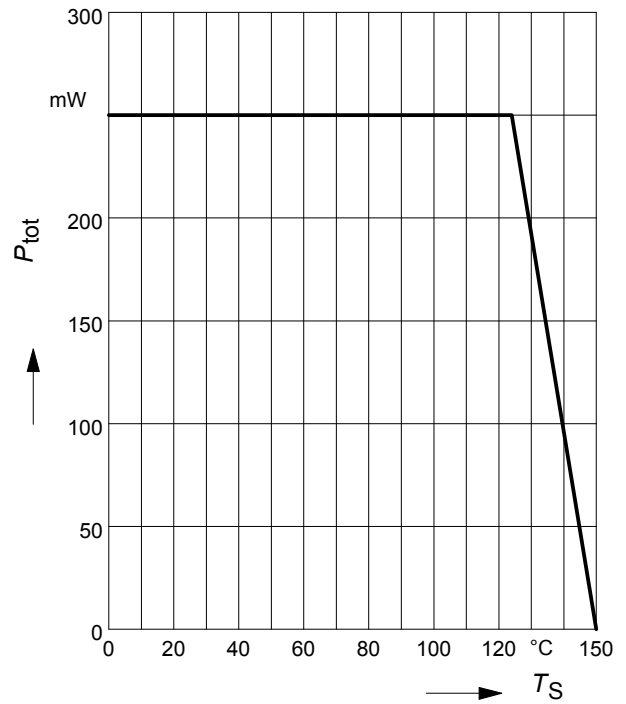
Total power dissipation $P_{\text{tot}} = f(T_S)$

BCR135T



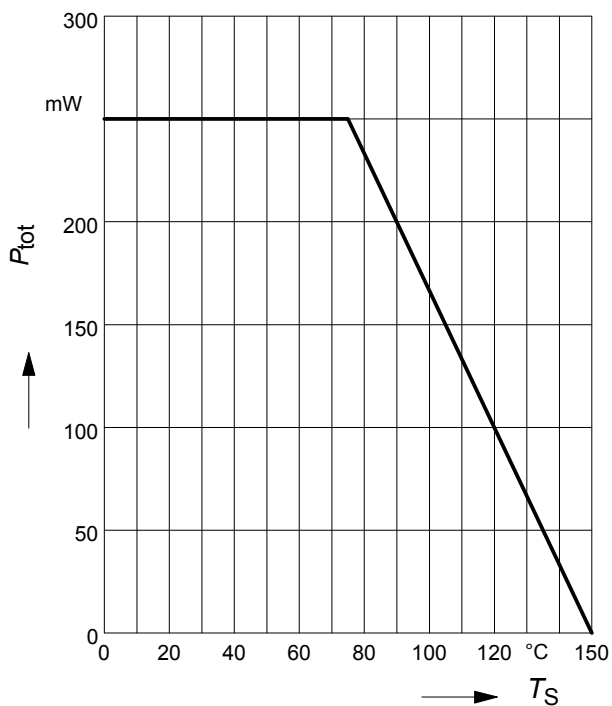
Total power dissipation $P_{\text{tot}} = f(T_S)$

BCR135W



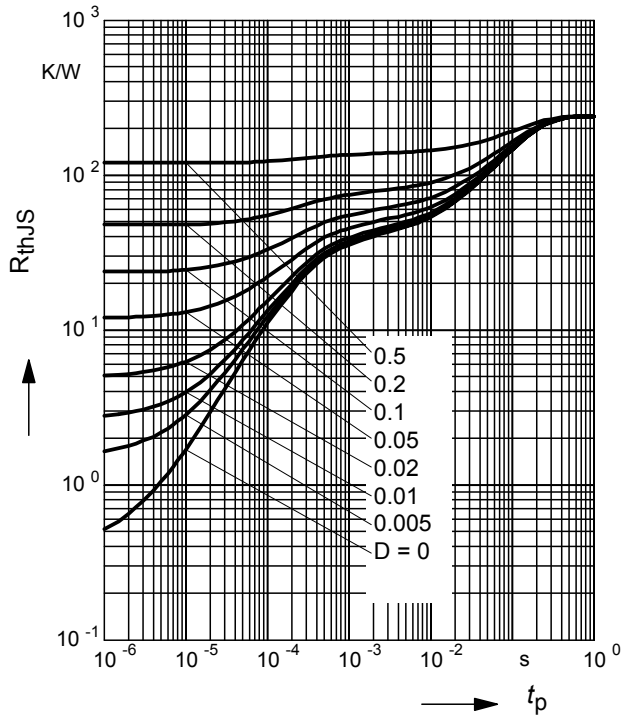
Total power dissipation $P_{\text{tot}} = f(T_S)$

SEMH9



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

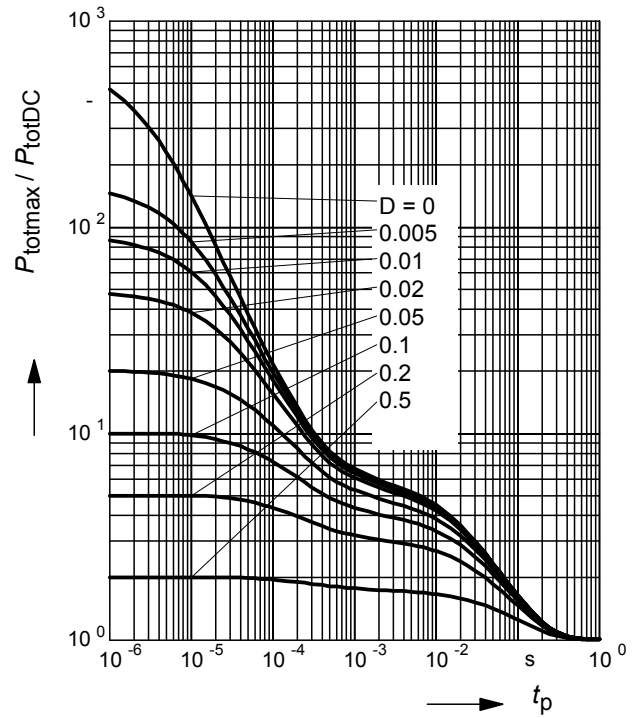
BCR135



Permissible Pulse Load

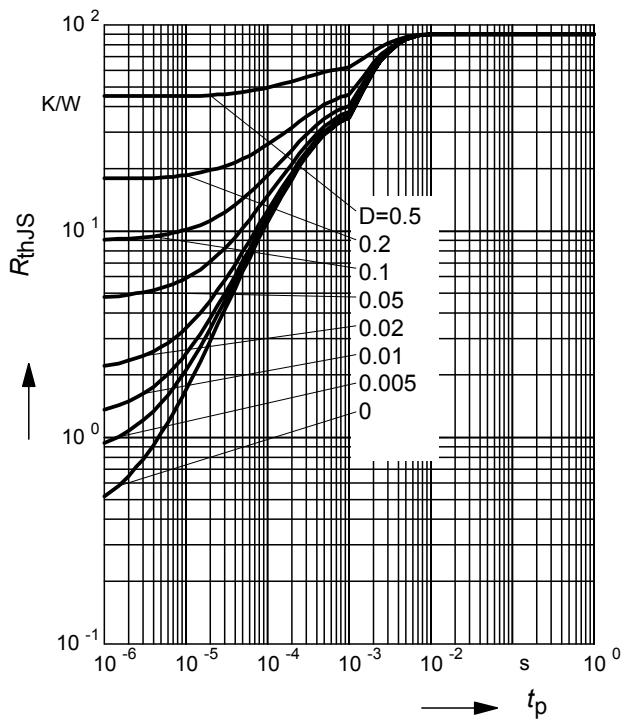
$$P_{totmax}/P_{totDC} = f(t_p)$$

BCR135



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

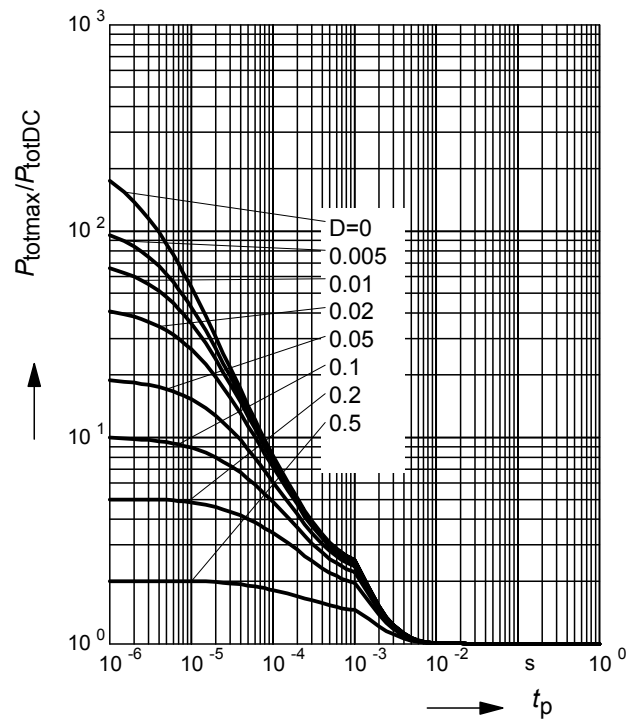
BCR135F



Permissible Pulse Load

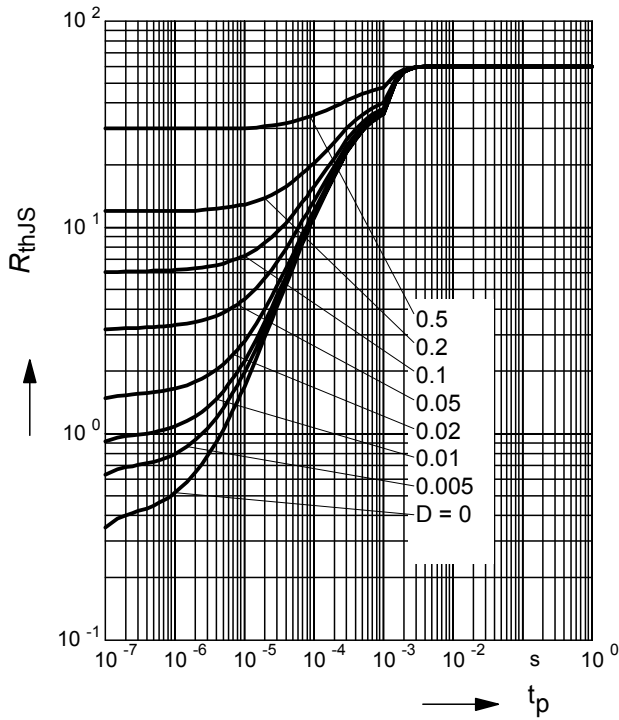
$$P_{totmax}/P_{totDC} = f(t_p)$$

BCR135F



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

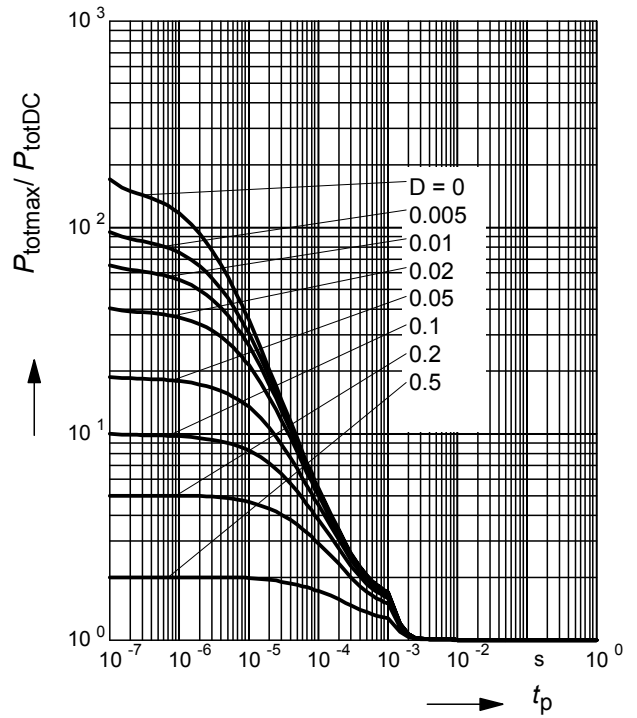
BCR135L3



Permissible Pulse Load

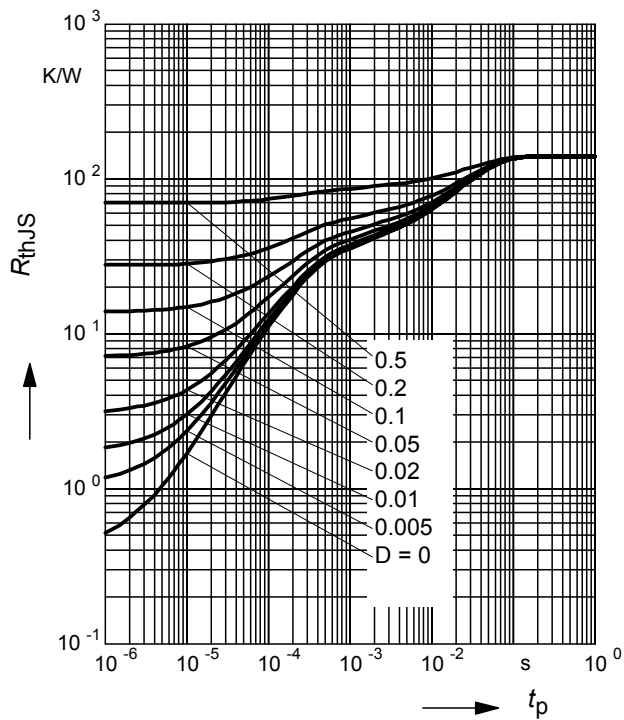
$$P_{totmax}/P_{totDC} = f(t_p)$$

BCR135L3



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

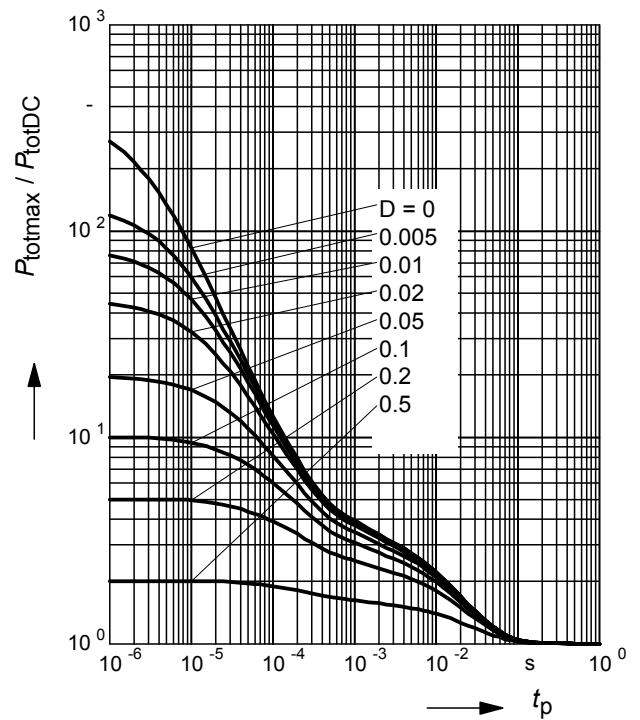
BCR135S



Permissible Pulse Load

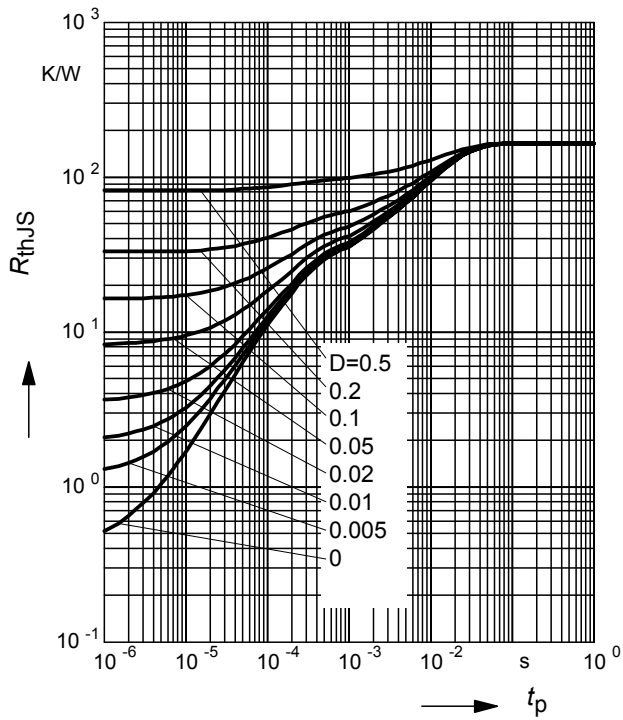
$$P_{totmax}/P_{totDC} = f(t_p)$$

BCR135S



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

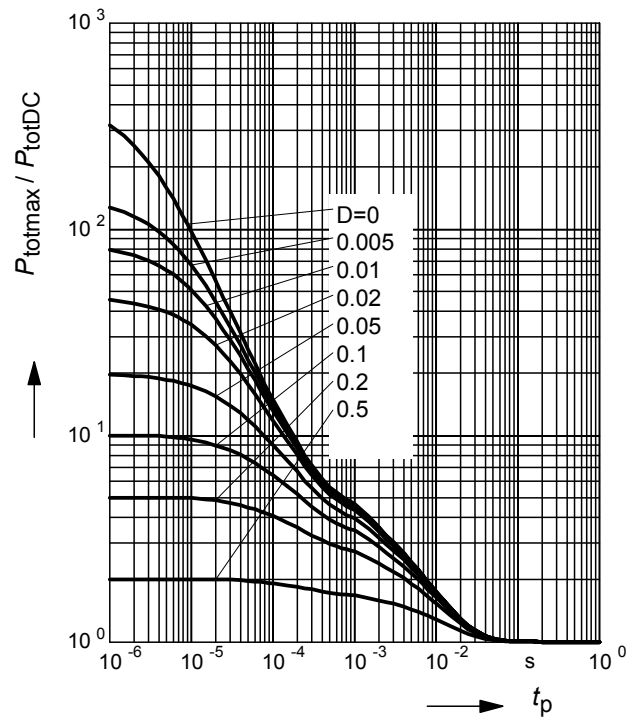
BCR135T



Permissible Pulse Load

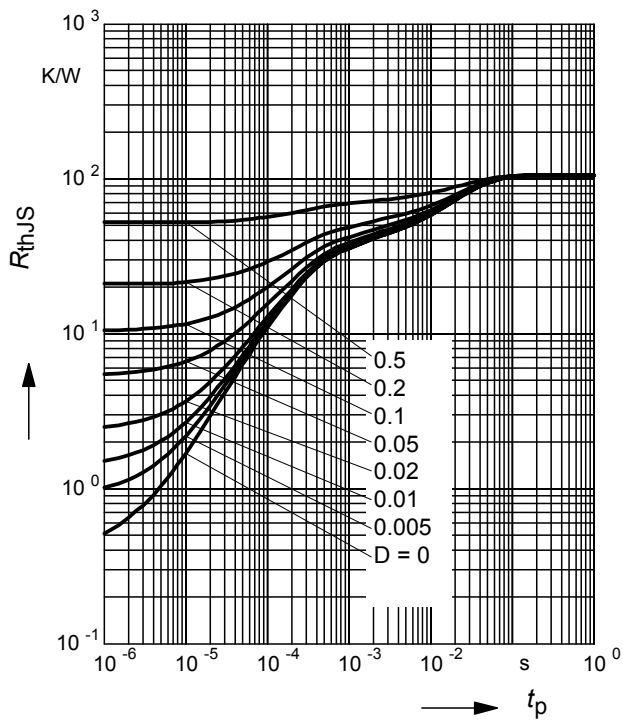
$$P_{totmax}/P_{totDC} = f(t_p)$$

BCR135T



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

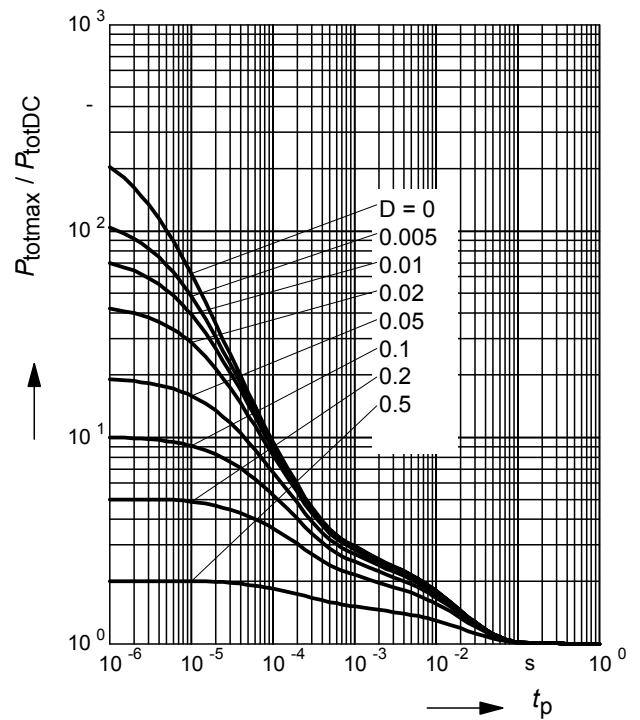
BCR135W



Permissible Pulse Load

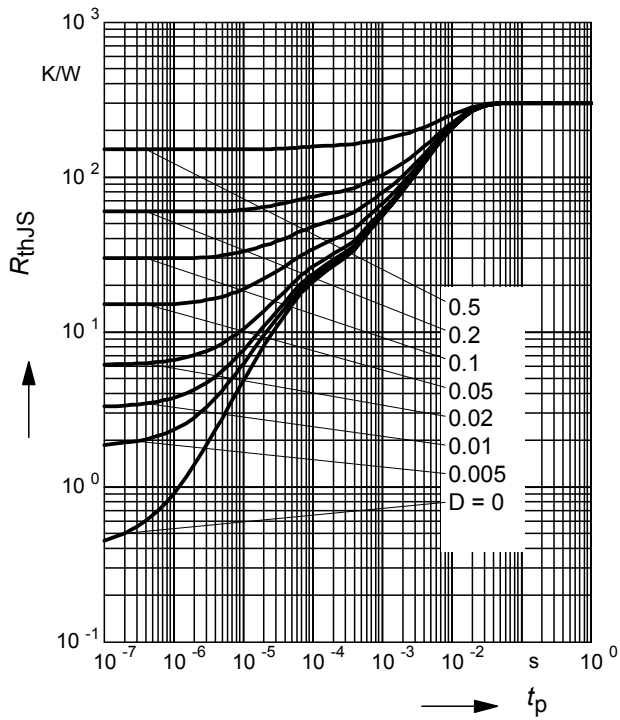
$$P_{totmax}/P_{totDC} = f(t_p)$$

BCR135W



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

SEMH9



Permissible Pulse Load

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

SEMH9

