POWERSEM

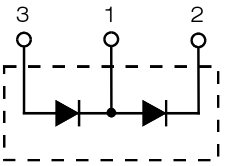
Diode Modules

PSKD 310

I_{FRMS} = 2x 480 A
I_{FAVM} = 2x 305 A
V_{RRM} = 800-1800 V

Preliminary Data Sheet

V_{RSM} V	V_{RRM} V	Type
900	**800**	**PSKD 310/08**
1300	**1200**	**PSKD 310/12**
1500	**1400**	**PSKD 310/14**
1700	**1600**	**PSKD 310/16**
1900	**1800**	**PSKD 310/18**



Symbol	Test Conditions		Maximum Ratings	
I_{FRMS}	$T_{VJ} = T_{VJM}$		480	A
I_{FAVM}	T_C = 100°C; 180° sine		305	A
I_{FSM}	T_{VJ} = 45°C;	t = 10 ms (50 Hz), sine	11 500	A
	$V_R = 0$	t = 8.3 ms (60 Hz), sine	12 200	A
	$T_{VJ} = T_{VJM}$	t = 10 ms (50 Hz), sine	9 600	A
	$V_R = 0$	t = 8.3 ms (60 Hz), sine	10 200	A
$\int i^2dt$	T_{VJ} = 45°C	t = 10 ms (50 Hz), sine	662 000	A^2s
	$V_R = 0$	t = 8.3 ms (60 Hz), sine	620 000	A^2s
	$T_{VJ} = T_{VJM}$	t = 10 ms (50 Hz), sine	460 000	A^2s
	$V_R = 0$	t = 8.3 ms (60 Hz), sine	430 000	A^2s
T_{VJ}			-40...+150	°C
T_{VJM}			150	°C
T_{stg}			-40...+125	°C
V_{ISOL}	50/60 Hz, RMS	t = 1 min	3000	V~
	$I_{ISOL} \leq 1$ mA	t = 1 s	3600	V~
M_d	Mounting torque (M5)		2.5-5/22-44 Nm/lb.in.	
	Terminal connection torque (M8)		12-15/106-132 Nm/lb.in.	
Weight	Typical including screws		320	g

Symbol	Test Conditions		Characteristic Values	
I_{RRM}	$T_{VJ} = T_{VJM}$; $V_R = V_{RRM}$		40	mA
V_F	I_F = 600 A; T_{VJ} = 25°C		1.2	V
V_{T0}	For power-loss calculations only		0.75	V
r_T	$T_{VJ} = T_{VJM}$		0.63	mΩ
R_{thJC}	per diode; DC current	other values see Fig. 6/7	0.129	K/W
	per module		0.065	K/W
R_{thJK}	per diode; DC current		0.169	K/W
	per module		0.0845	K/W
Q_S	T_{VJ} = 125°C, I_F = 400 A; -di/dt = 50 A/μs		760	μC
I_{RM}			275	A
d_S	Creepage distance on surface		12.7	mm
d_A	Strike distance through air		9.6	mm
a	Maximum allowable acceleration		50	m/s^2

Data according to IEC 60747 and refer to a single thyristor/diode unless otherwise stated.

Features

- Direct copper bonded Al_2O_3 -ceramic base plate
- Planar passivated chips
- Isolation voltage 3600 V~
- UL registered, E 148688

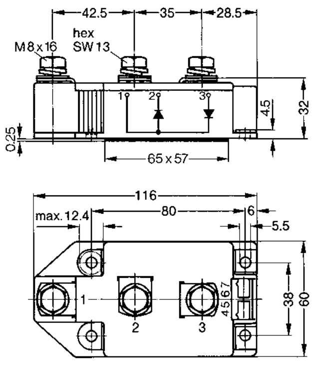
Applications

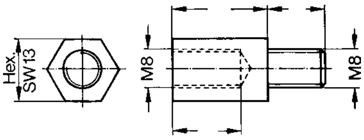
- Supplies for DC power equipment
- DC supply for PWM inverter
- Field supply for DC motors
- Battery DC power supplies

Advantages

- Space and weight savings
- Simple mounting
- Improved temperature and power cycling
- Reduced protection circuits

Dimensions in mm (1 mm = 0.0394")





Threaded spacer for higher Anode/Cathode construction: Type **ZY 250**, material brass

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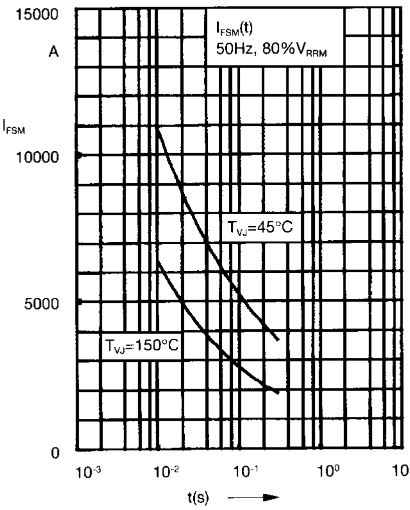

Fig. 1 Surge overload current
I_{FSM}: Crest value, t: duration

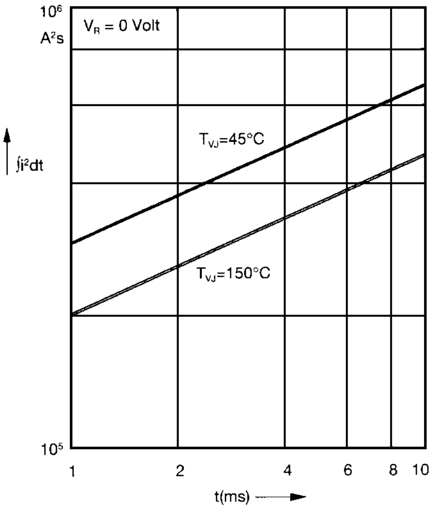

Fig. 2 ∫i²dt versus time (1-10 ms)

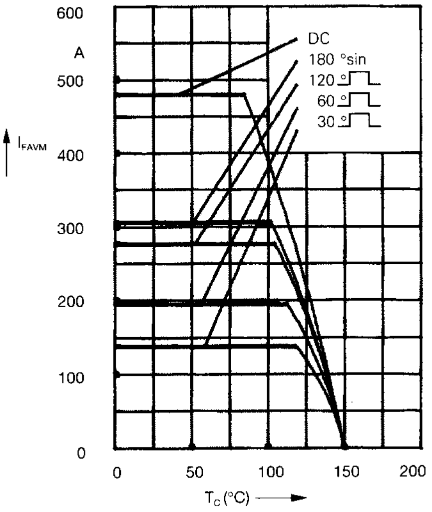

Fig. 2a Maximum forward current
at case temperature

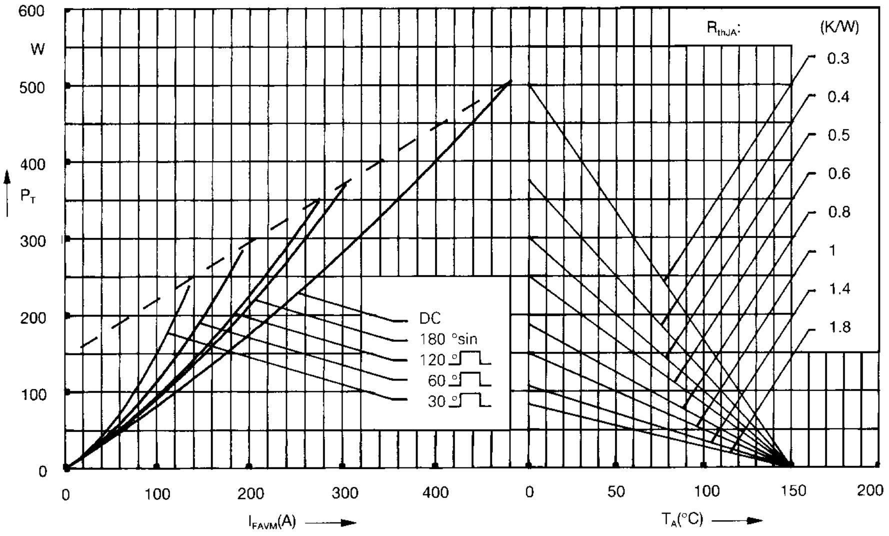

Fig. 3 Power dissipation versus
forward current and ambient
temperature (per diode)

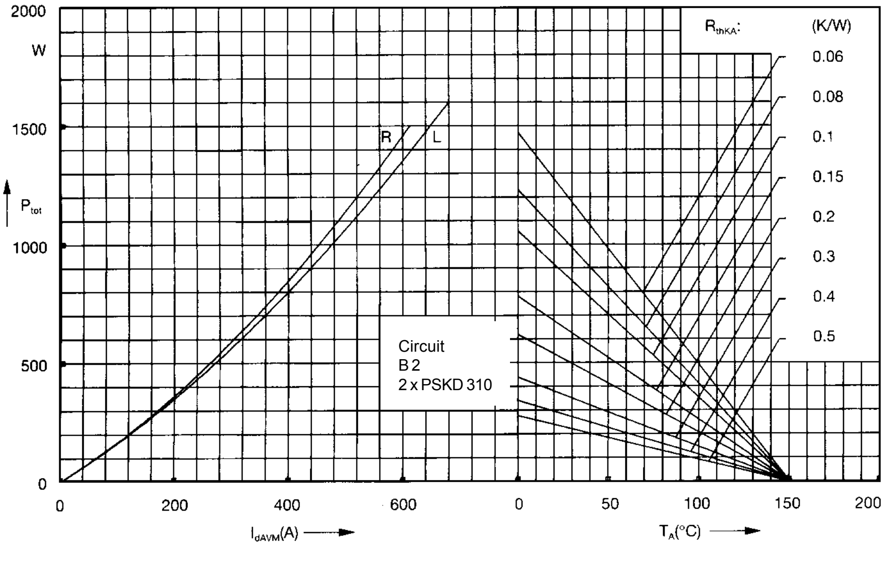

Fig. 4 Single phase rectifier bridge:
Power dissipation versus direct
output current and ambient
temperature
R = resistive load
L = inductive load

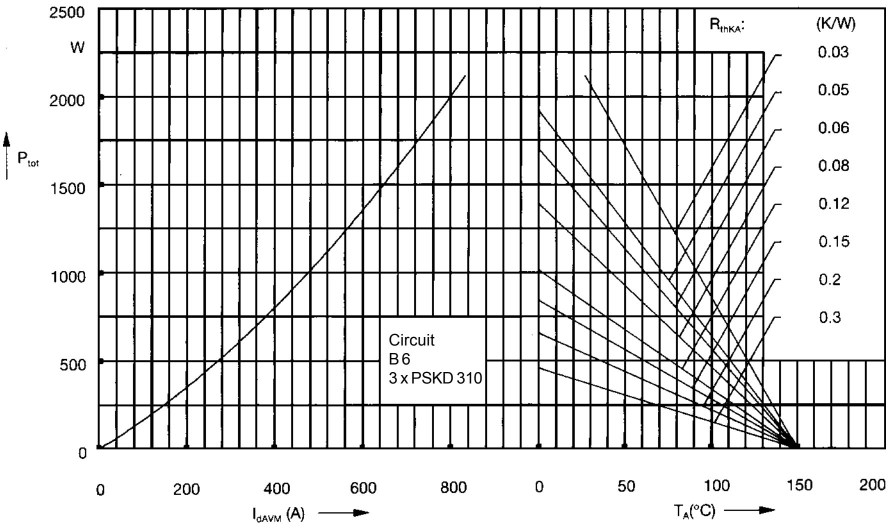

Fig. 5 Three phase rectifier bridge: Power dissipation versus direct output current and ambient temperature

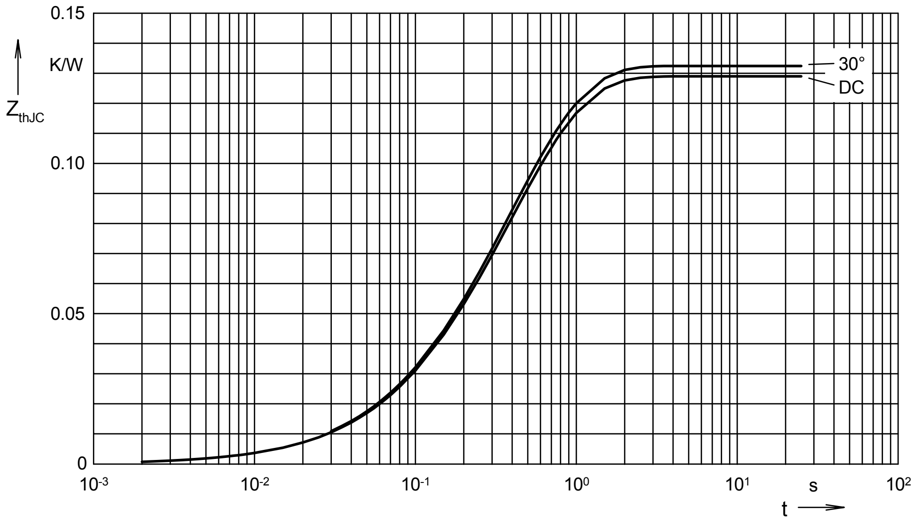

Fig. 6 Transient thermal impedance junction to case (per diode)

R_{thJC} for various conduction angles d:

d	R_{thJC} (K/W)
DC	0.129
180°	0.131
120°	0.132
60°	0.132
30°	0.133

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.0035	0.0099
2	0.0165	0.168
3	0.1091	0.456

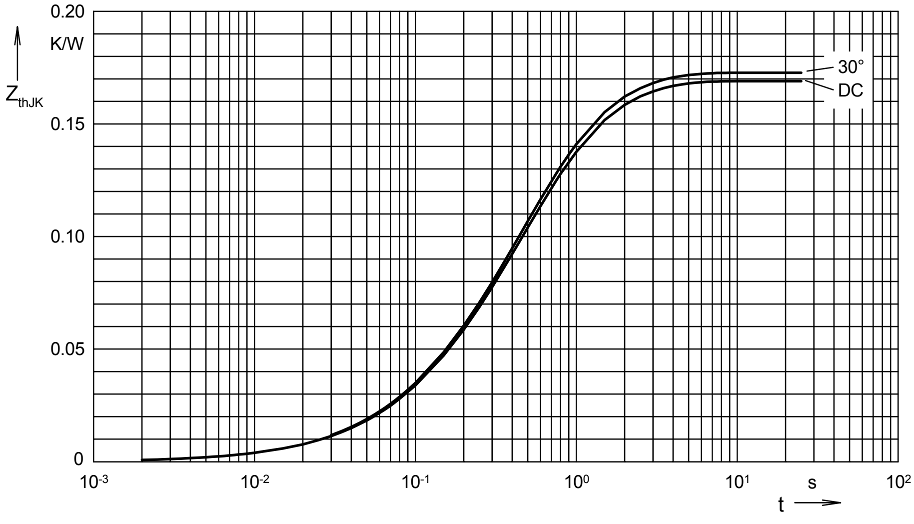

Fig. 7 Transient thermal impedance junction to heatsink (per diode)

R_{thJK} for various conduction angles d:

d	R_{thJK} (K/W)
DC	0.169
180°	0.171
120°	0.172
60°	0.172
30°	0.173

Constants for Z_{thJK} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.0035	0.0099
2	0.0165	0.168
3	0.1091	0.456
4	0.04	1.36