

## Diode Modules

## PSKD 220

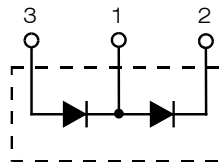
$$I_{FRMS} = 2x 450 A$$

$$I_{FAVM} = 2x 270 A$$

$$V_{RRM} = 800-1600 V$$

Preliminary Data Sheet

$V_{RSM}$ V	$V_{RRM}$ V	Type
900	800	PSKD 220/08
1300	1200	PSKD 220/12
1500	1400	PSKD 220/14
1700	1600	PSKD 220/16



Symbol	Test Conditions	Maximum Ratings
$I_{FRMS}$	$T_{VJ} = T_{VJM}$	450 A
$I_{FAVM}$	$T_C = 100^\circ C$ ; 180° sine	270 A
$I_{FSM}$	$T_{VJ} = 45^\circ C$ ; $V_R = 0$	t = 10 ms (50 Hz), sine 8500 A
		t = 8.3 ms (60 Hz), sine 9000 A
	$T_{VJ} = T_{VJM}$	t = 10 ms (50 Hz), sine 7500 A
	$V_R = 0$	t = 8.3 ms (60 Hz), sine 8000 A
$\int i^2 dt$	$T_{VJ} = 45^\circ C$	t = 10 ms (50 Hz), sine 360 000 A <sup>2</sup> s
	$V_R = 0$	t = 8.3 ms (60 Hz), sine 340 000 A <sup>2</sup> s
	$T_{VJ} = T_{VJM}$	t = 10 ms (50 Hz), sine 280 000 A <sup>2</sup> s
	$V_R = 0$	t = 8.3 ms (60 Hz), sine 260 000 A <sup>2</sup> s
$T_{VJ}$		-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

### Features

- Direct copper bonded Al<sub>2</sub>O<sub>3</sub> -ceramic base plate
- Planar passivated chips
- Isolation voltage 3600 V~
- UL registered, E 148688

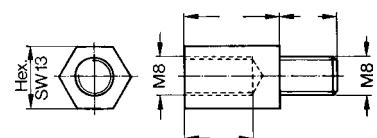
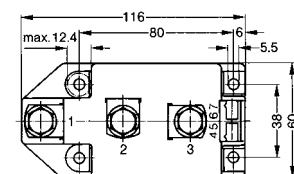
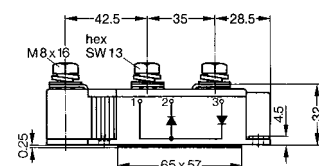
### Applications

- 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")



Symbol	Test Conditions	Characteristic Values
$I_{RRM}$	$T_{VJ} = T_{VJM}$ ; $V_R = V_{RRM}$	40 mA
$V_F$	$I_F = 600 A$ ; $T_{VJ} = 25^\circ C$	1.4 V
$V_{TO}$	For power-loss calculations only	0.75 V
$r_T$	$T_{VJ} = T_{VJM}$	0.9 mΩ
$R_{thJC}$	per diode; DC current per module other values see Fig. 6/7	0.129 K/W
		0.065 K/W
		0.169 K/W
$R_{thJK}$	per diode; DC current per module	0.0845 K/W
$Q_S$	$T_{VJ} = 125^\circ C$ , $I_F = 400 A$ ; $-di/dt = 50 A/\mu s$	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 <sup>2</sup>

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

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

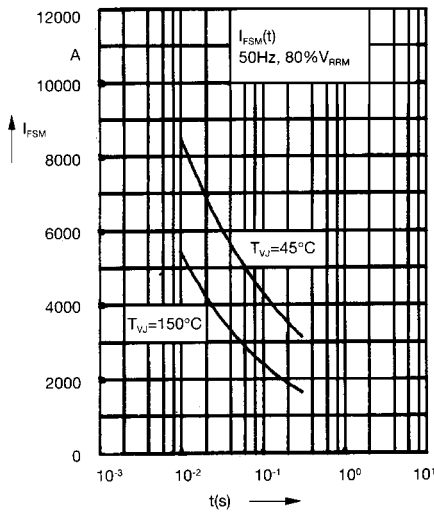


Fig. 1 Surge overload current  
 $I_{FSM}$ : Crest value,  $t$ : duration

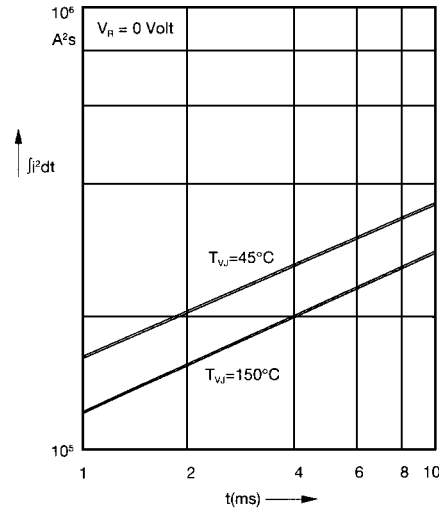


Fig. 2  $j^2dt$  versus time (1-10 ms)

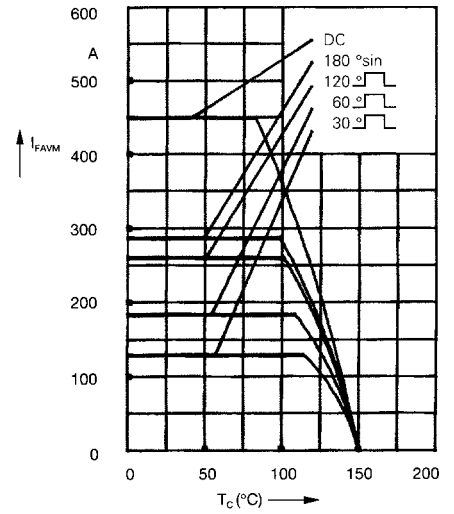


Fig. 2a Maximum forward current at case temperature

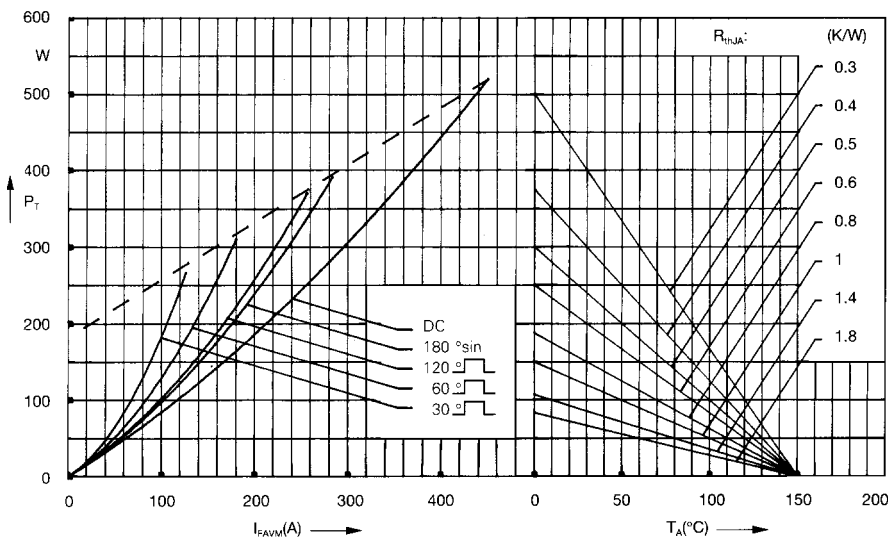


Fig. 3 Power dissipation versus forward current and ambient temperature (per diode)

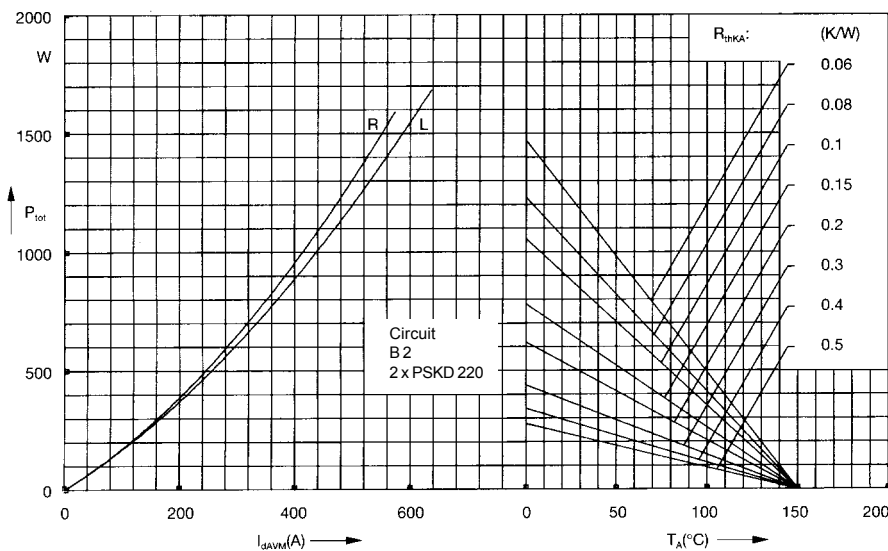


Fig. 4 Single phase rectifier bridge:  
 Power dissipation versus direct output current and ambient temperature  
 R = resistive load  
 L = inductive load

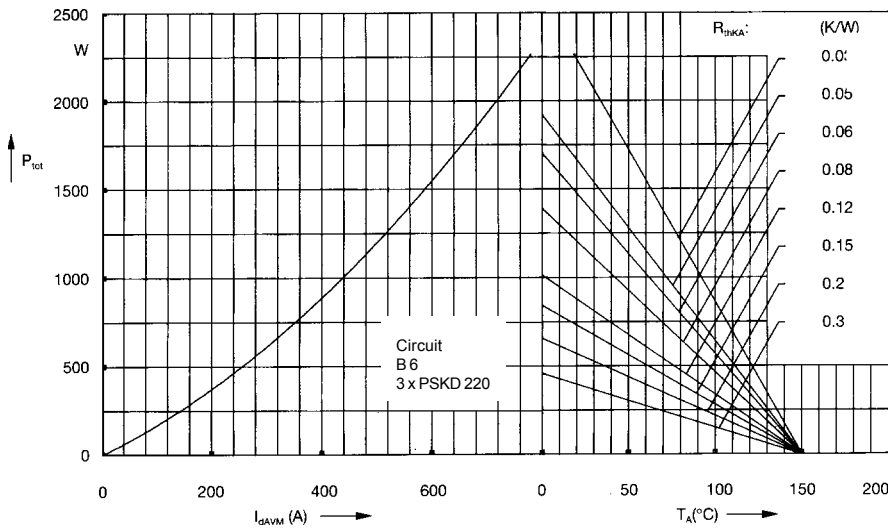


Fig. 5 Three phase rectifier bridge:  
Power dissipation versus direct  
output current and ambient  
temperature

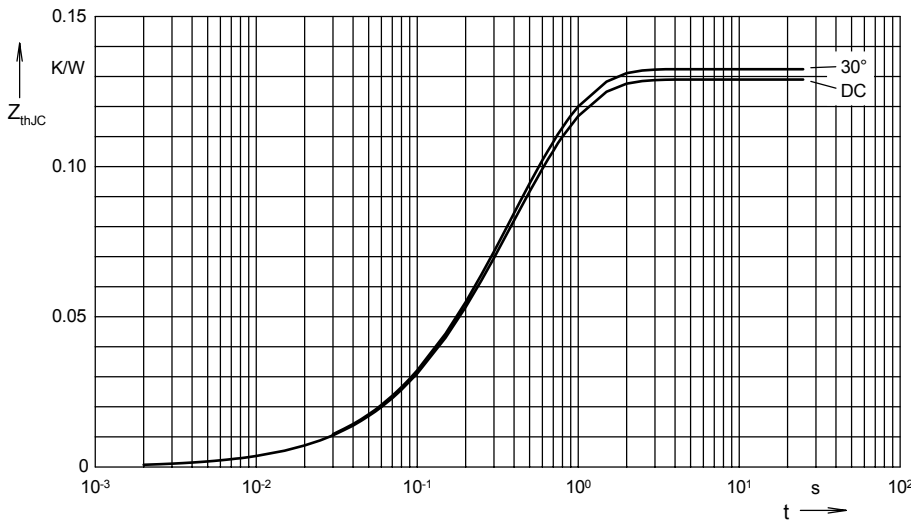


Fig. 6 Transient thermal impedance  
junction to case (per diode)

$R_{thJC}$  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

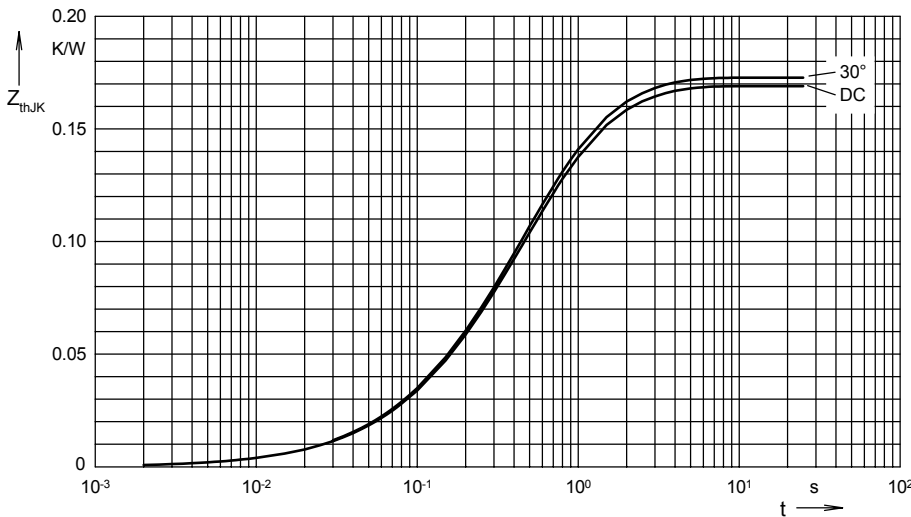


Fig. 7 Transient thermal impedance  
junction to heatsink (per diode)

$R_{thJK}$  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