

## Diode Modules

## PSKD 72

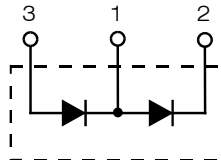
$$I_{FRMS} = 2x 180 A$$

$$I_{FAVM} = 2x 113 A$$

$$V_{RRM} = 800-1800 V$$

Preliminary Data Sheet

$V_{RSM}$ V	$V_{RRM}$ V	Type
900	800	PSKD 72/08
1300	1200	PSKD 72/12
1500	1400	PSKD 72/14
1700	1600	PSKD 72/16
1900	1800	PSKD 72/18



Symbol	Test Conditions	Maximum Ratings	
$I_{FRMS}$	$T_{VJ} = T_{VJM}$	180 A	
$I_{FAVM}$	$T_C = 92^\circ C$ ; 180° sine	113 A	
	$T_C = 100^\circ C$ ; 180° sine	99 A	
$I_{FSM}$	$T_{VJ} = 45^\circ C$ ; $V_R = 0$	t = 10 ms (50 Hz), sine t = 8.3 ms (60 Hz), sine	1700 A 1950 A
	$T_{VJ} = T_{VJM}$ ; $V_R = 0$	t = 10 ms (50 Hz), sine t = 8.3 ms (60 Hz), sine	1540 A 1800 A
$\int i^2 dt$	$T_{VJ} = 45^\circ C$ ; $V_R = 0$	t = 10 ms (50 Hz), sine t = 8.3 ms (60 Hz), sine	14 450 A <sup>2</sup> s 15 700 A <sup>2</sup> s
	$T_{VJ} = T_{VJM}$ ; $V_R = 0$	t = 10 ms (50 Hz), sine t = 8.3 ms (60 Hz), sine	11 850 A <sup>2</sup> s 13 400 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)		2.5-4/22-35 Nm/lb.in.
	Terminal connection torque (M5)		2.5-4/22-35 Nm/lb.in.
Weight	Typical including screws		90 g

### Features

- International standard package JEDEC TO-240 AA
- 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

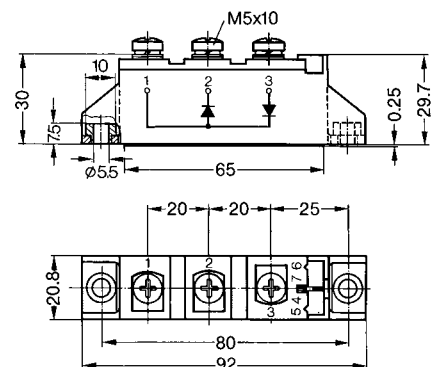
### Applications

- 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
$I_R$	$T_{VJ} = T_{VJM}$ ; $V_R = V_{RRM}$	15 mA
$V_F$	$I_F = 300 A$ ; $T_{VJ} = 25^\circ C$	1.6 V
$V_{T0}$	For power-loss calculations only	0.8 V
$r_T$	$T_{VJ} = T_{VJM}$	2.3 mΩ
$Q_S$	$T_{VJ} = 125^\circ C$ ; $I_F = 50 A$ , -di/dt = 3 A/μs	170 μC
$I_{RM}$		45 A
$R_{thJC}$	per diode; DC current per module	0.35 K/W
		other values see Fig. 6/7
$R_{thJK}$	per diode; DC current per module	0.55 K/W
		0.275 K/W
$d_s$	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.

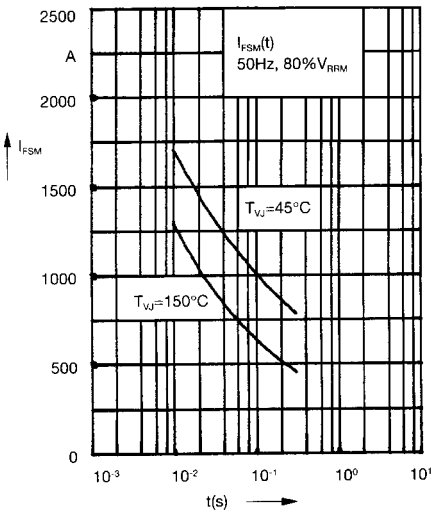


Fig. 1 Surge overload current  
 $I_{FSM}$ : Crest value,  $t$ : duration

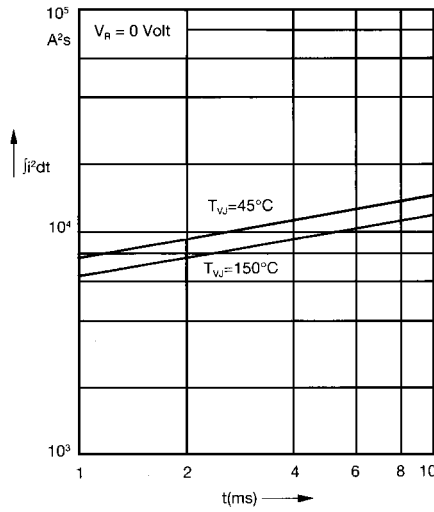


Fig. 2  $j^2t$  versus time (1-10 ms)

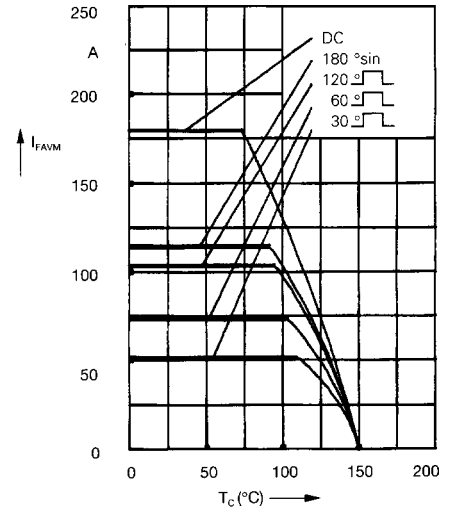


Fig. 2a Maximum forward current at case temperature

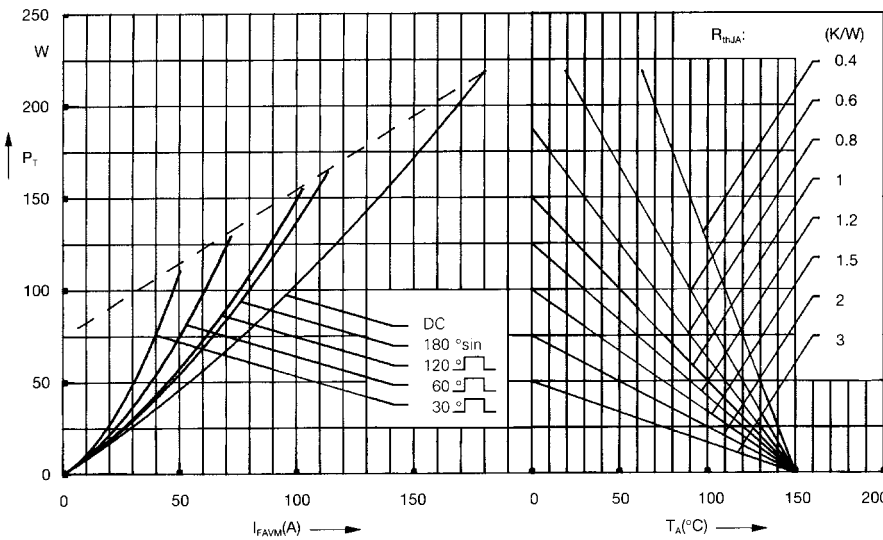


Fig. 3 Power dissipation versus forward current and ambient temperature (per diode)

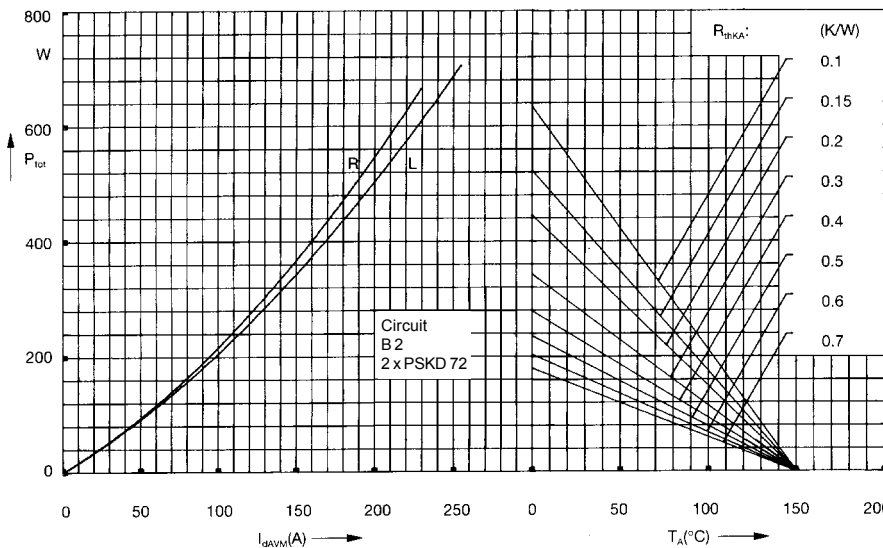


Fig. 4 Single phase rectifier bridge:  
 Power dissipation versus direct output current and ambient temperature  
 R = resistive load  
 L = inductive load

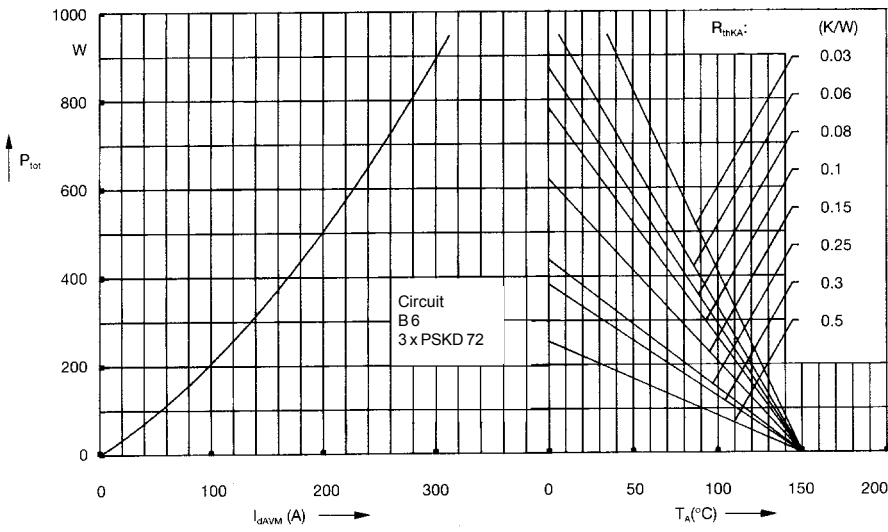


Fig. 5 Three phase rectifier bridge: Power dissipation versus direct output current and ambient temperature

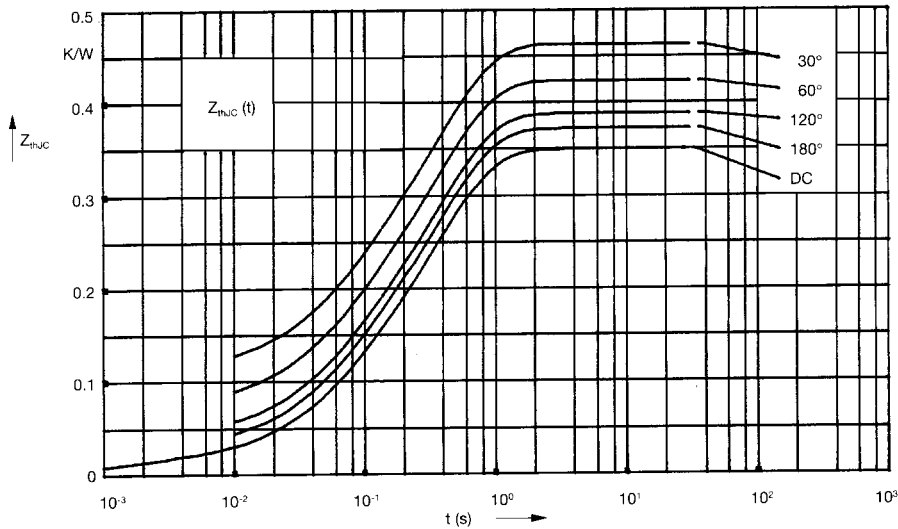


Fig. 6 Transient thermal impedance junction to case (per diode)

$R_{thJC}$  for various conduction angles  $d$ :

$d$	$R_{thJC}$ (K/W)
DC	0.35
180°	0.37
120°	0.39
60°	0.43
30°	0.47

Constants for  $Z_{thJC}$  calculation:

$i$	$R_{thi}$ (K/W)	$t_i$ (s)
1	0.013	0.0014
2	0.072	0.062
3	0.265	0.375

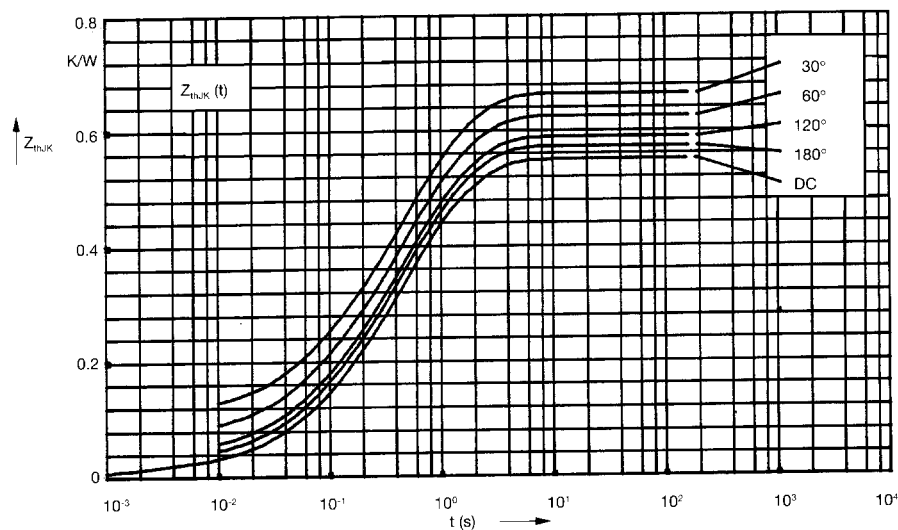


Fig. 7 Transient thermal impedance junction to heatsink (per diode)

$R_{thJK}$  for various conduction angles  $d$ :

$d$	$R_{thJK}$ (K/W)
DC	0.55
180°	0.57
120°	0.59
60°	0.63
30°	0.67

Constants for  $Z_{thJK}$  calculation:

$i$	$R_{thi}$ (K/W)	$t_i$ (s)
1	0.013	0.0014
2	0.072	0.062
3	0.265	0.375
4	0.2	1.32