

Diode Modules

PSKD 72

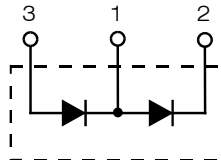
$$I_{FRMS} = 2 \times 180 \text{ A}$$

$$I_{FAVM} = 2 \times 113 \text{ A}$$

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

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} I_{FAVM}	$T_{VJ} = T_{VJM}$	180 A	
	$T_C = 92^\circ\text{C}; 180^\circ \text{ sine}$	113 A	
	$T_C = 100^\circ\text{C}; 180^\circ \text{ sine}$	99 A	
I_{FSM}	$T_{VJ} = 45^\circ\text{C}; V_R = 0$	t = 10 ms (50 Hz), sine: 1700 A t = 8.3 ms (60 Hz), sine: 1950 A	
	$T_{VJ} = T_{VJM}; V_R = 0$	t = 10 ms (50 Hz), sine: 1540 A t = 8.3 ms (60 Hz), sine: 1800 A	
	$\int i^2 dt$	$T_{VJ} = 45^\circ\text{C}; V_R = 0$	t = 10 ms (50 Hz), sine: 14 450 A ² s t = 8.3 ms (60 Hz), sine: 15 700 A ² s
		$T_{VJ} = T_{VJM}; V_R = 0$	t = 10 ms (50 Hz), sine: 11 850 A ² s t = 8.3 ms (60 Hz), sine: 13 400 A ² 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~ t = 1 s: 3600 V~	
	$I_{ISOL} \leq 1 \text{ mA}$		
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_2O_3 -ceramic base plate
- Planar passivated chips
- Isolation voltage 3600 V~
- UL registered, E 148688

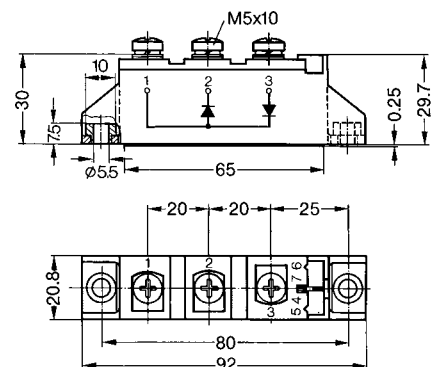
Applications

- 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")



Symbol	Test Conditions	Characteristic Values
I_R	$T_{VJ} = T_{VJM}; V_R = V_{RRM}$	15 mA
V_F	$I_F = 300 \text{ A}; T_{VJ} = 25^\circ\text{C}$	1.6 V
V_{T0}	For power-loss calculations only	0.8 V
r_T	$T_{VJ} = T_{VJM}$	2.3 mΩ
Q_S	$T_{VJ} = 125^\circ\text{C}; I_F = 50 \text{ A}, -di/dt = 3 \text{ A}/\mu\text{s}$	170 μC
I_{RM}		45 A
R_{thJC}	per diode; DC current per module	0.35 K/W
		other values see Fig. 6/7: 0.175 K/W
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 ²

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

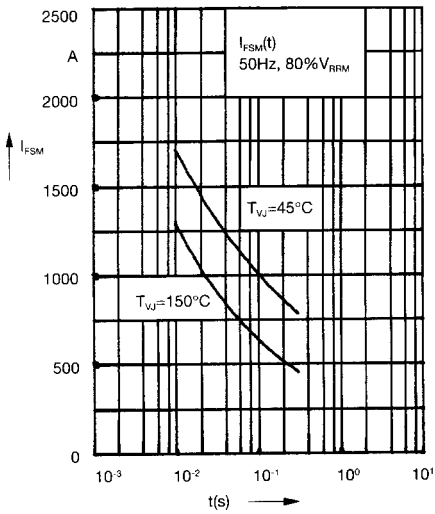


Fig. 1 Surge overload current
 I_{FSM} : Crest value, t : duration

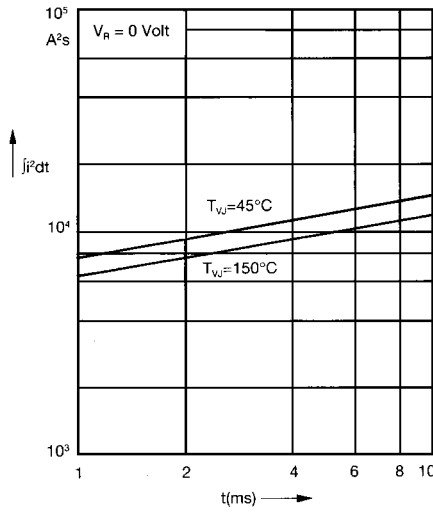


Fig. 2 j^2t versus time (1-10 ms)

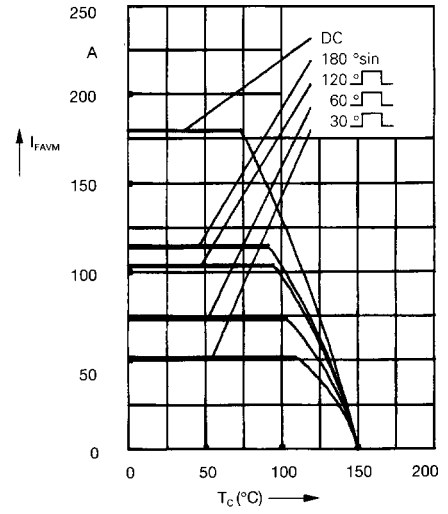


Fig. 2a Maximum forward current at case temperature

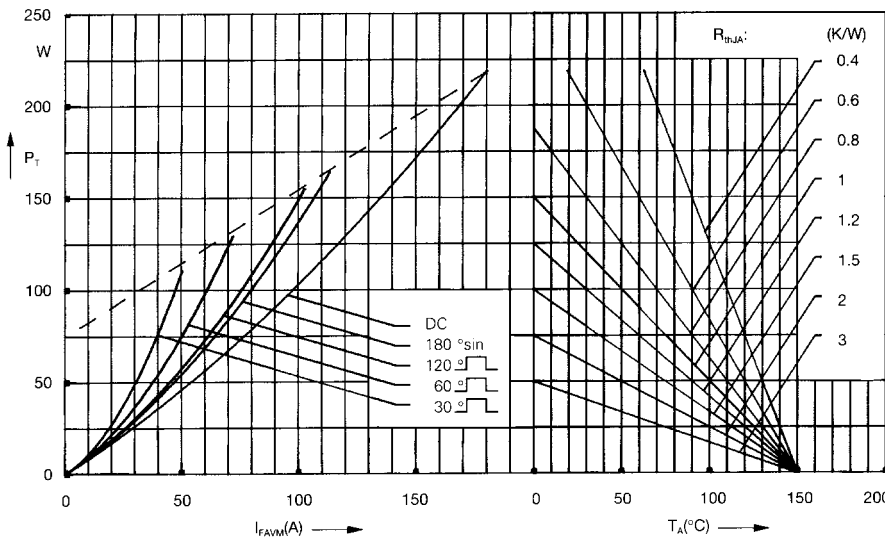


Fig. 3 Power dissipation versus forward current and ambient temperature (per diode)

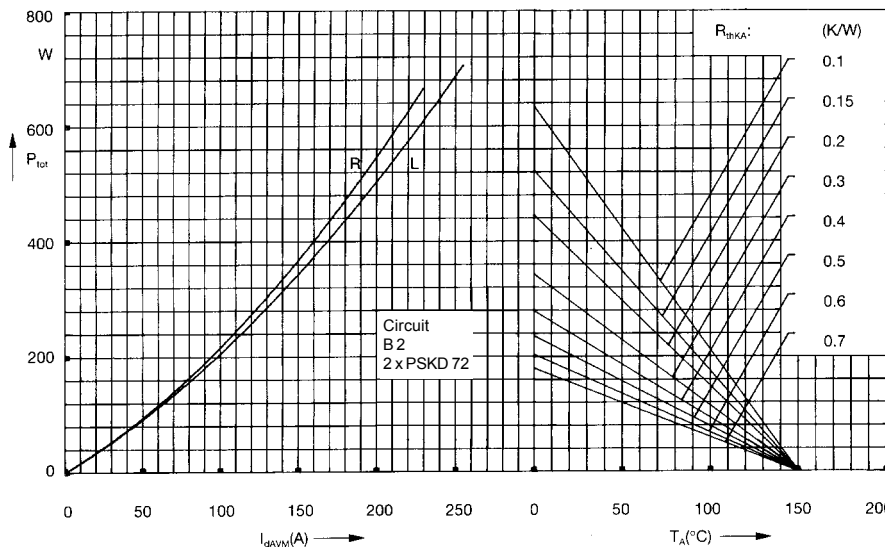


Fig. 4 Single phase rectifier bridge:
 Power dissipation versus direct output current and ambient temperature
 R = resistive load
 L = inductive load

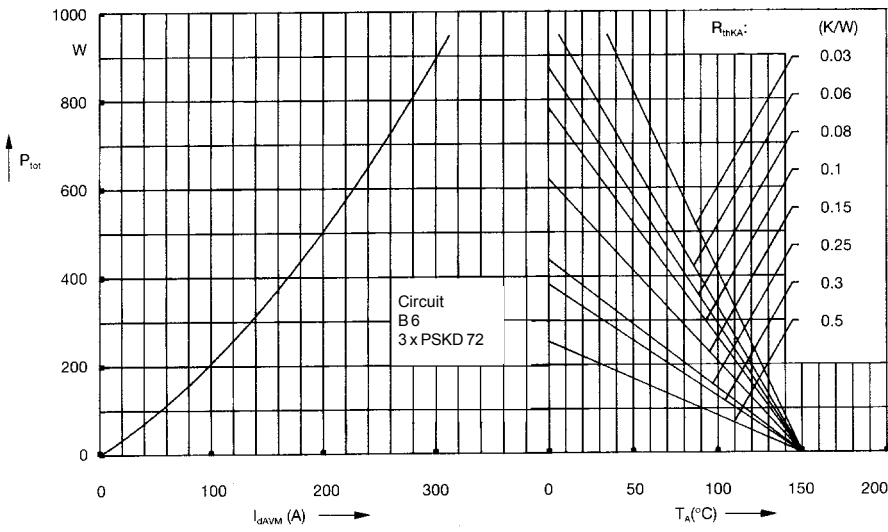


Fig. 5 Three phase rectifier bridge: Power dissipation versus direct output current and ambient temperature

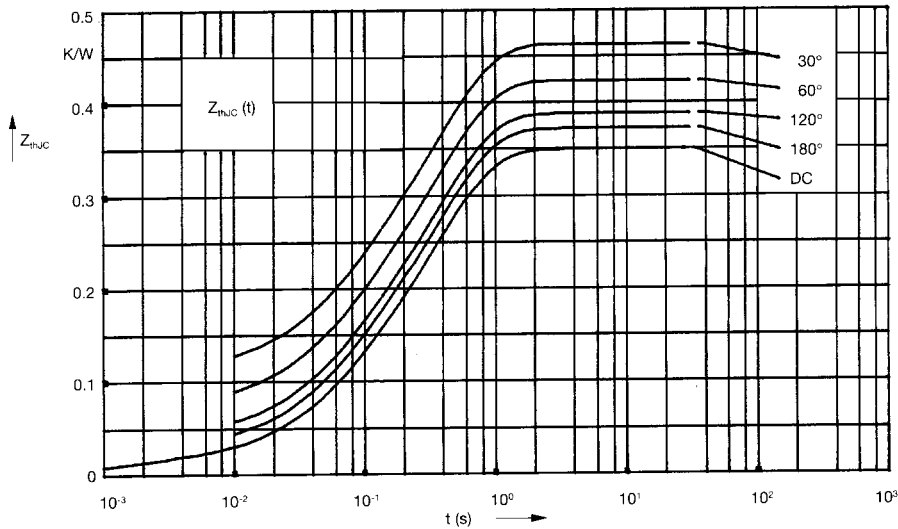


Fig. 6 Transient thermal impedance junction to case (per diode)

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

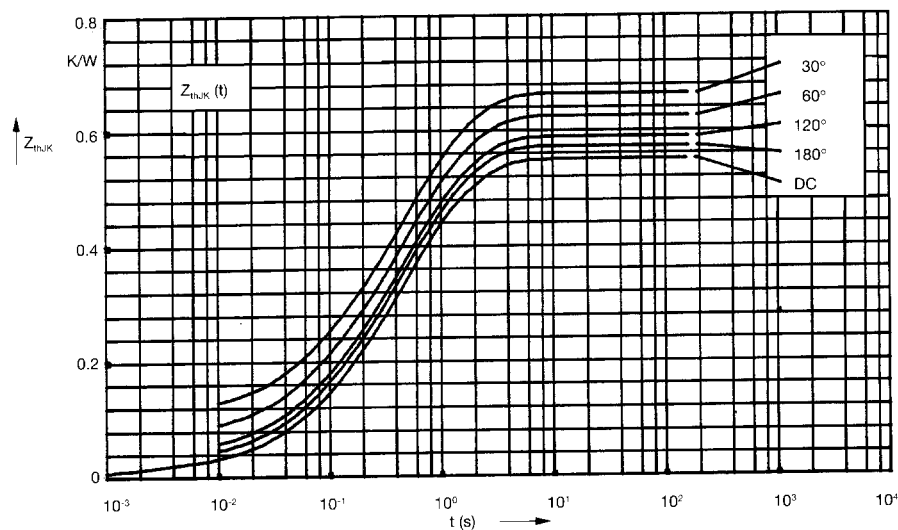


Fig. 7 Transient thermal impedance junction to heatsink (per diode)

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