

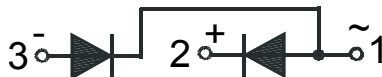
High Voltage Diode Module (TRACTION - PAC™)

PSTKD 82

$$\begin{aligned} I_{FRMS} &= 180 \text{ A} \\ I_{FAVM} &= 82 \text{ A} \\ V_{RRM} &= 600-1800 \text{ V} \end{aligned}$$

Preliminary Data Sheet

V_{RSM} V	V_{RRM} V	Type
700	600	PSTKD 82/06
900	800	PSTKD 82/08
1100	1000	PSTKD 82/10
1300	1200	PSTKD 82/12
1500	1400	PSTKD 82/14
1700	1600	PSTKD 82/16
1900	1800	PSTKD 82/18



Features

- International standard package, JEDEC TO-240 AA
- Direct Copper Bonded Al_2O_3 -ceramic base plate
- Planar passivated chips
- Isolation voltage 3600 V~

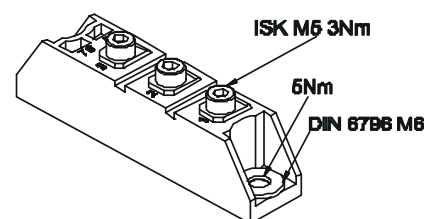
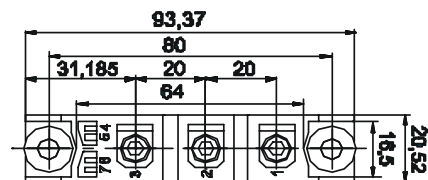
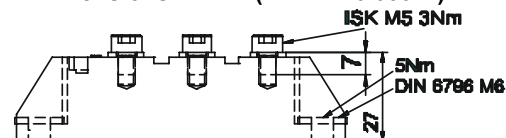
Applications

- 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 with two screws
- Improved temperature and power cycling
- Reduced protection circuits

Dimensions in mm (1 mm = 0.0394")



Symbol	Test Conditions		Maximum Ratings	
I_{FRMS} I_{FAVM}	$T_{VJ} = T_{VJM}$		180	A
	$T_C = 110^{\circ}\text{C}; 180^{\circ} \text{ sine}$		82	A
I_{TSM}	$T_{VJ} = 45^{\circ}\text{C};$ $V_R = 0$	$t = 10 \text{ ms (50 Hz)}$	1700	A
		$t = 8.3 \text{ ms (60 Hz)}$	1950	A
	$T_{VJ} = T_{VJM}$ $V_R = 0$	$t = 10 \text{ ms (50 Hz)}$	1530	A
		$t = 8.3 \text{ ms (60 Hz)}$	1740	A
$\partial i^2/dt$	$T_{VJ} = 45^{\circ}\text{C}$ $V_R = 0$	$t = 10 \text{ ms (50 Hz)}$	14450	A^2s
		$t = 8.3 \text{ ms (60 Hz)}$	15700	A^2s
	$T_{VJ} = T_{VJM}$ $V_R = 0$	$t = 10 \text{ ms (50 Hz)}$	11700	A^2s
		$t = 8.3 \text{ ms (60 Hz)}$	12500	A^2s
T_{VJ}			-40 ...125	$^{\circ}\text{C}$
T_{VJM}			125	$^{\circ}\text{C}$
T_{stg}			-40 ...125	$^{\circ}\text{C}$
V_{ISOL}	50/60 Hz, RMS	$t = 1 \text{ min}$	3000	V~
	$I_{ISOL} \leq 1 \text{ mA}$	$t = 1 \text{ s}$	3600	V~
M_d	Mounting torque (M5)		5.0/44	Nm/lb.in.
	Terminal connection torque (ISK M5)		3.0/26	Nm/lb.in.
Weight	Typical including screws		56	g

Symbol	Test Conditions	Characteristic Values	
I_{RRM}, I_{DRM}	$T_{VJ} = T_{VJM}; V_R = V_{RRM}$	15	mA
V_T	$I_T = 200 \text{ A}; T_{VJ} = 25^\circ\text{C}$	1.74	V
V_{T0}	For power-loss calculations only ($T_{VJ} = T_{VJM}$)	0.8	V
r_T	$T_{VJ} = T_{VJM}$	2.7	$\text{m}\Omega$
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	0.35	K/W
	per module	0.18	K/W
R_{thJK}	per diode; DC current	0.55	K/W
	per module	0.275	K/W
d_s	Creeping distance on surface	12.7	mm
d_A	Creepage distance in 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.

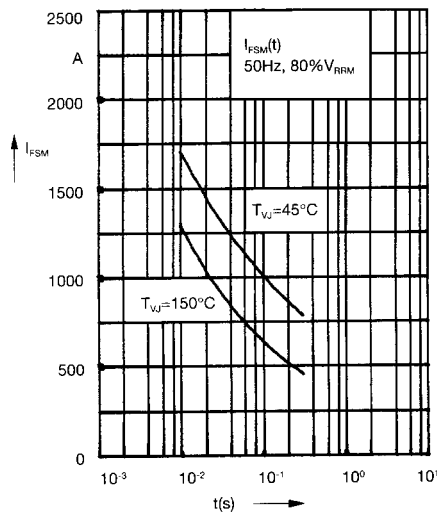


Fig. 1 Surge overload current
 I_{FSM} : Crest value, t : duration

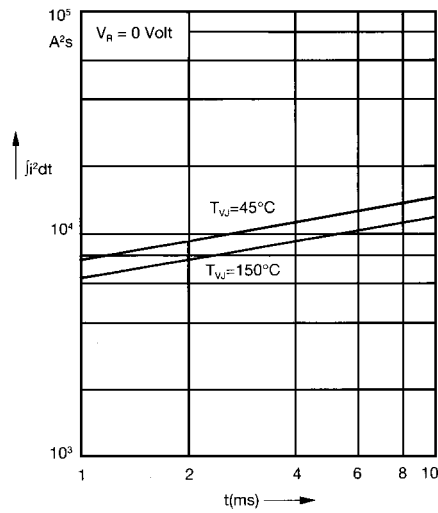


Fig. 2 j^2dt versus time (1-10 ms)

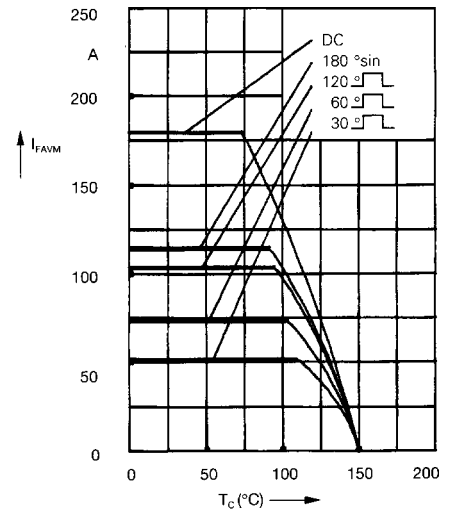


Fig. 2a Maximum forward current at case temperature

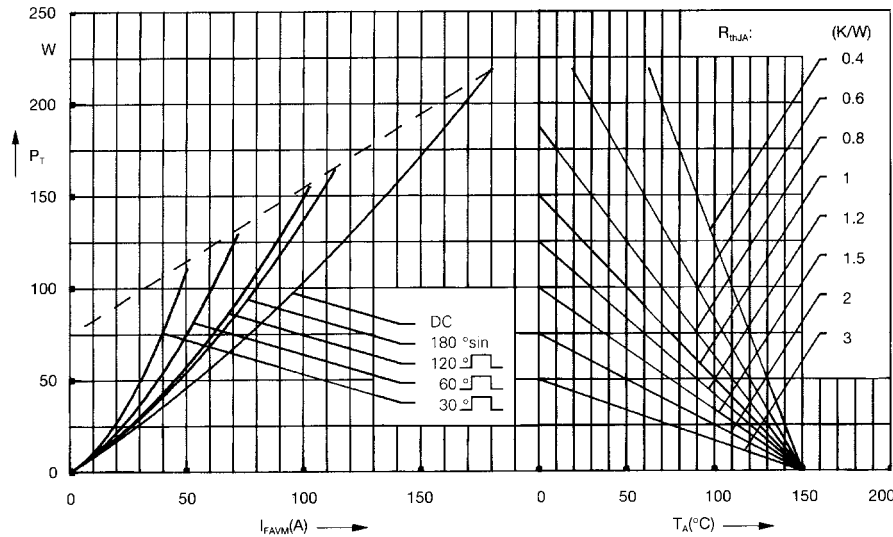


Fig. 3 Power dissipation versus forward current and ambient temperature (per diode)

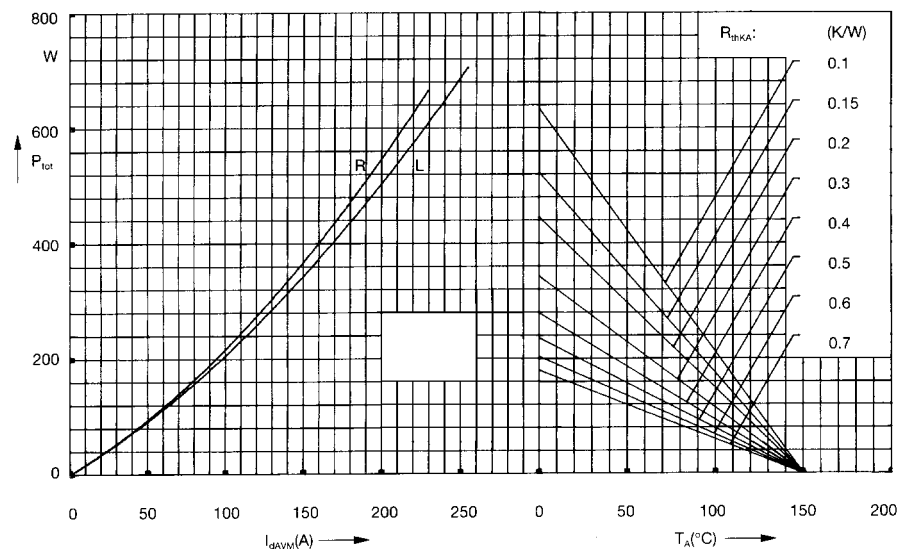


Fig. 4 Single phase rectifier bridge:
Power dissipation versus direct output current and ambient temperature
R = resistive load
L = inductive load

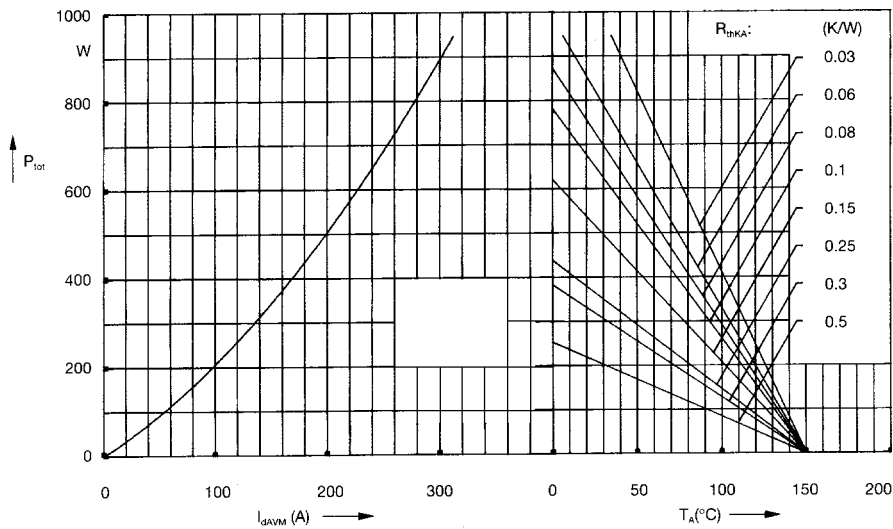


Fig. 5 Three phase rectifier bridge:
Power dissipation versus direct
output current and ambient
temperature

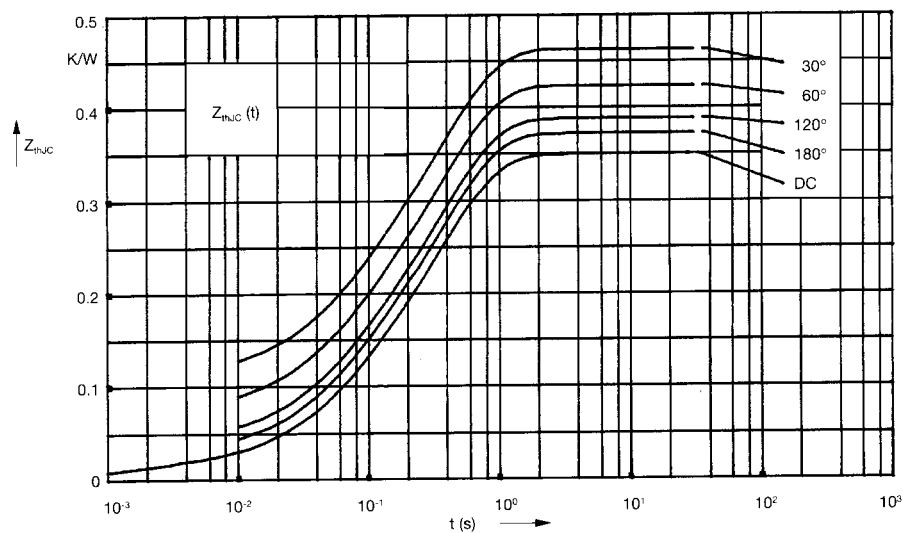


Fig. 6 Transient thermal impedance
junction to case (per diode)

R_{thJC} for various conduction angles d:

d	R_{thJC} (K/W)
DC	0.35
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

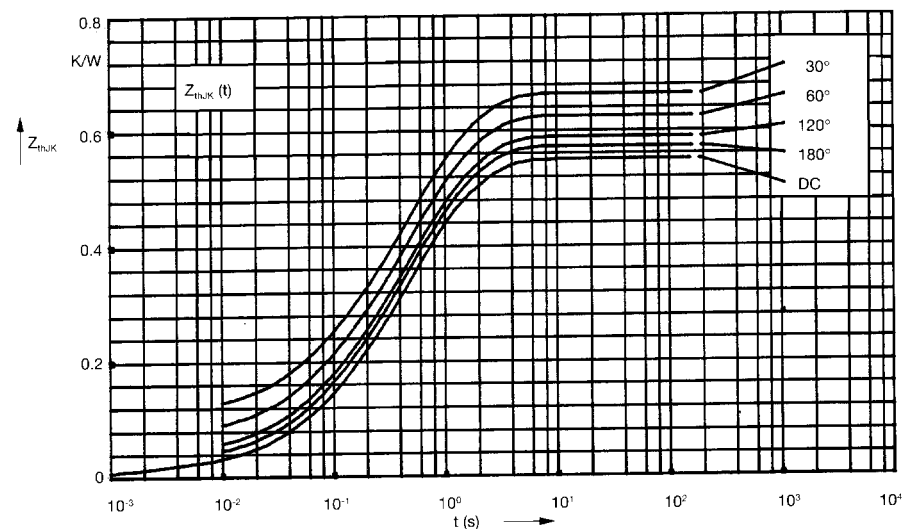


Fig. 7 Transient thermal impedance
junction to heatsink (per diode)

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