

Diode Modules

PSKD 312

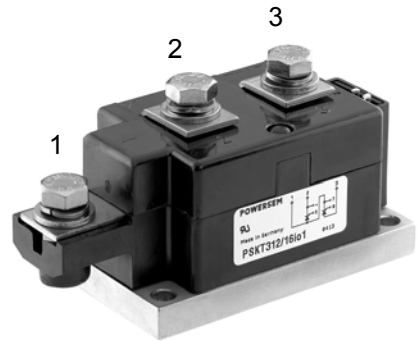
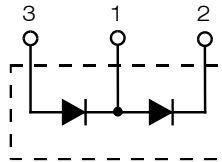
$$I_{FRMS} = 2 \times 520 \text{ A}$$

$$I_{FAVM} = 2 \times 310 \text{ A}$$

$$V_{RRM} = 1200\text{-}2200 \text{ V}$$

Preliminary Data Sheet

V_{RSM} V	V_{RRM} V	Type
1300	1200	PSKD 312/12
1500	1400	PSKD 312/14
1700	1600	PSKD 312/16
1900	1800	PSKD 312/18
2100	2000	PSKD 312/20
2300	2200	PSKD 312/22



Symbol	Test Conditions	Maximum Ratings
I_{FRMS} I_{FAVM}	$T_{VJ} = T_{VJM}$ $T_C = 100^\circ\text{C}; 180^\circ \text{ sine}$	520 A 310 A
I_{FSM}	$T_{VJ} = 45^\circ\text{C};$ $V_R = 0$	$t = 10 \text{ ms (50 Hz)}$ 10500 A
		$t = 8.3 \text{ ms (60 Hz)}$ 11200 A
ji^2dt	$T_{VJ} = 45^\circ\text{C}$ $V_R = 0$	$t = 10 \text{ ms (50 Hz)}$ 551000 A ² s
		$t = 8.3 \text{ ms (60 Hz)}$ 527000 A ² s
T_{VJ} T_{VJM} T_{stg}	$T_{VJ} = T_{VJM}$ $V_R = 0$	$t = 10 \text{ ms (50 Hz)}$ 9200 A
		$t = 8.3 \text{ ms (60 Hz)}$ 9800 A
V_{ISOL}	50/60 Hz, RMS $I_{ISOL} \leq 1 \text{ mA}$	$t = 1 \text{ min}$ 3000 V~
		$t = 1 \text{ s}$ 3600 V~
M_d	Mounting torque (M6) Terminal connection torque (M8)	4.5-7/40-62 Nm/lb.in.
		11-13/97-115 Nm/lb.in.
Weight	Typical including screws	750 g

Symbol	Test Conditions	Characteristic Values
I_{RRM}	$T_{VJ} = T_{VJM}; V_R = V_{RRM}$	30 mA
V_F	$I_F = 600 \text{ A}; T_{VJ} = 25^\circ\text{C}$	1.32 V
V_{T0} r_T	For power-loss calculations only $T_{VJ} = T_{VJM}$	0.8 V 0.6 mΩ
R_{thJC}	per diode; DC current per module	0.12 K/W
		0.06 K/W
R_{thJK}	per diode; DC current per module	0.16 K/W
		0.08 K/W
Q_S	$T_{VJ} = 125^\circ\text{C}; I_F = 400 \text{ A}; -di/dt = 50 \text{ A}/\mu\text{s}$	700 μC
I_{RM}		260 A
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

Features

- Direct copper bonded Al₂O₃ -ceramic base plate
- Planar passivated chips
- Isolation voltage 3600 V~
- UL registered, E 148688

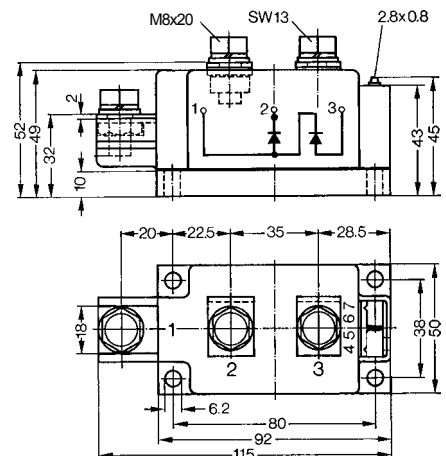
Applications

- 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")



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

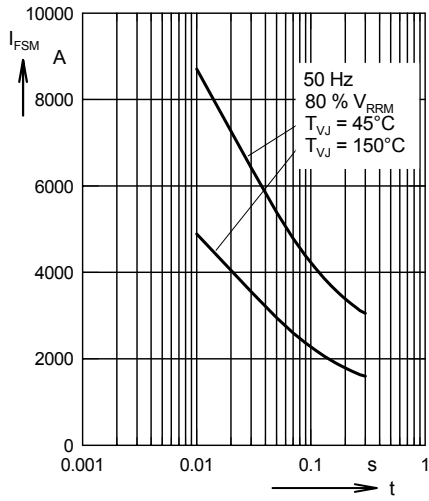


Fig. 1 Surge overload current
 I_{FSM} : Crest value, t : duration

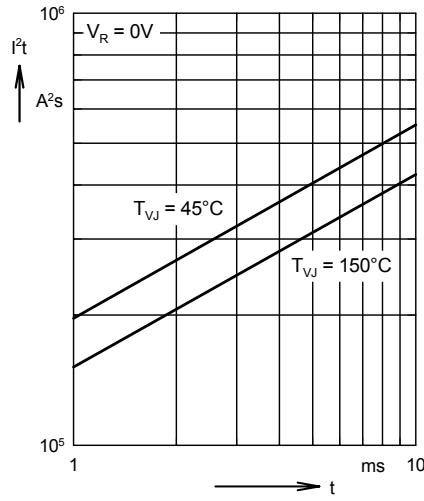


Fig. 2 I^2t versus time (1-10 ms)

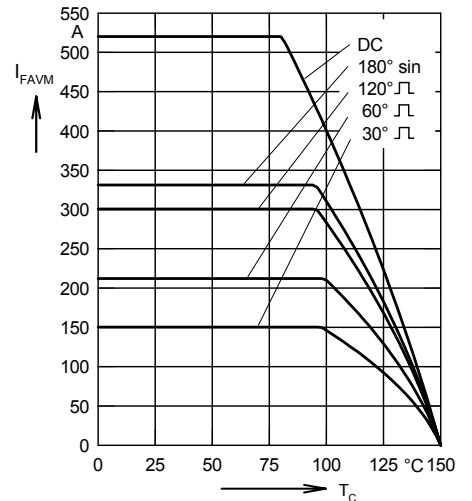


Fig. 3 Maximum forward current at case temperature

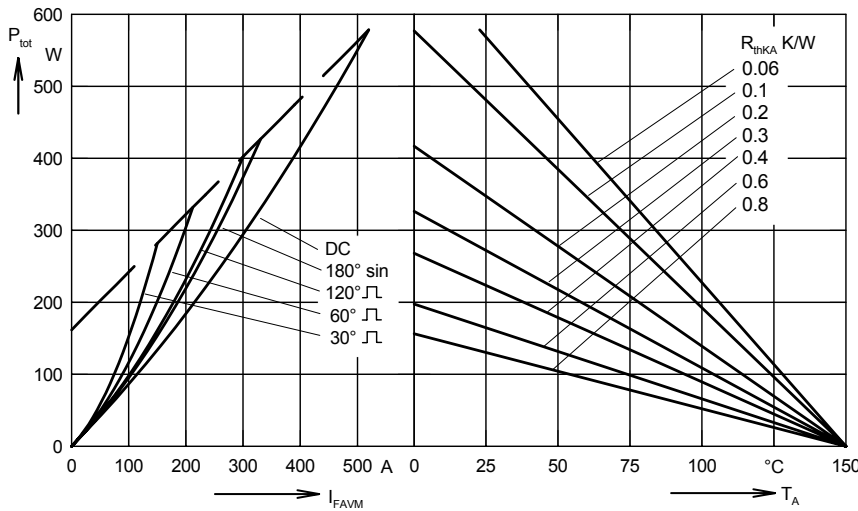


Fig. 4 Power dissipation versus forward current and ambient temperature (per diode)

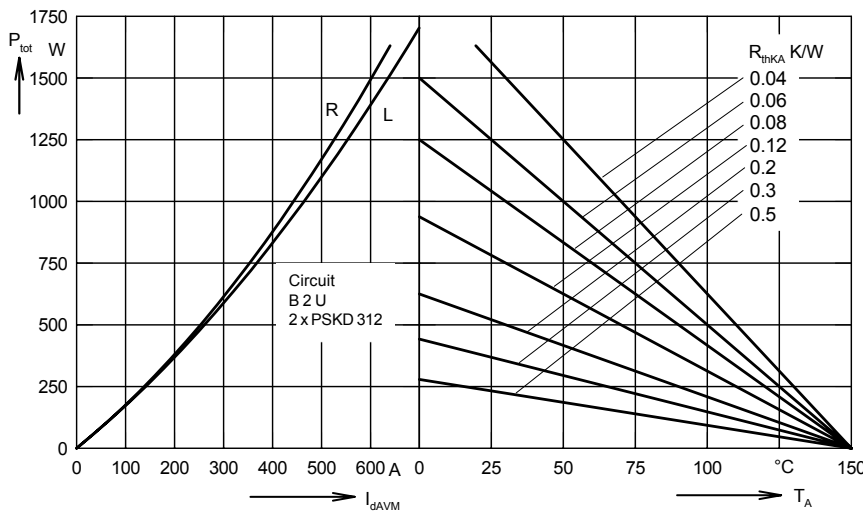


Fig. 5 Single phase rectifier bridge:
 Power dissipation versus direct output current and ambient temperature
 R = resistive load
 L = inductive load

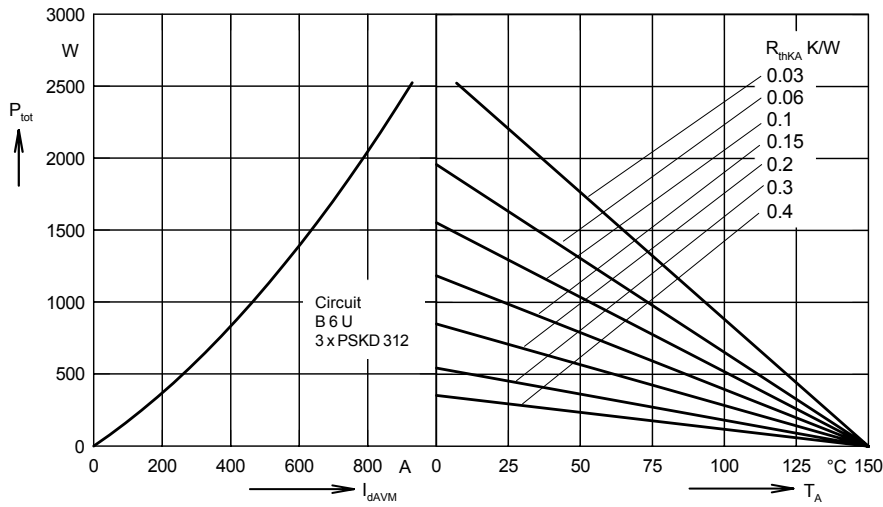


Fig. 6 Three phase rectifier bridge: Power dissipation versus direct output current and ambient temperature

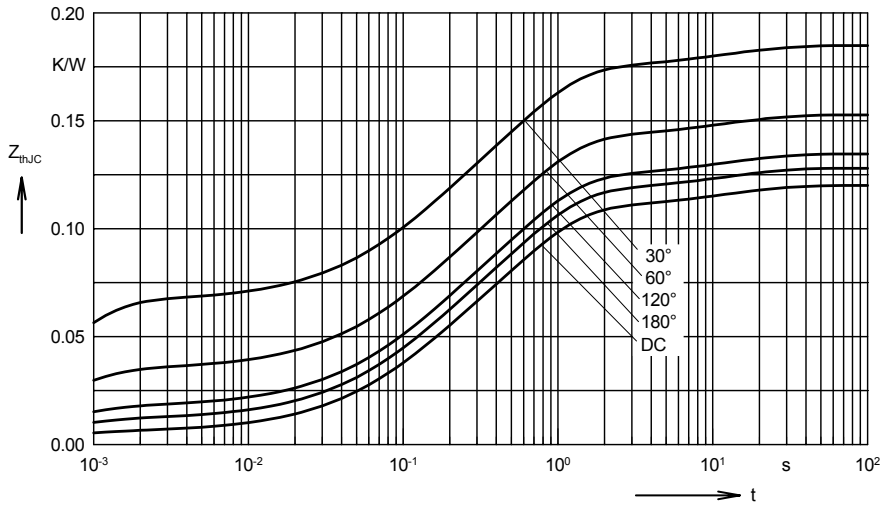


Fig. 7 Transient thermal impedance junction to case (per diode)

R_{thJC} for various conduction angles d:

d	R_{thJC} (K/W)
DC	0.120
180°C	0.128
120°C	0.135
60°C	0.153
30°C	0.185

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.0058	0.00054
2	0.031	0.098
3	0.072	0.54
4	0.0112	12

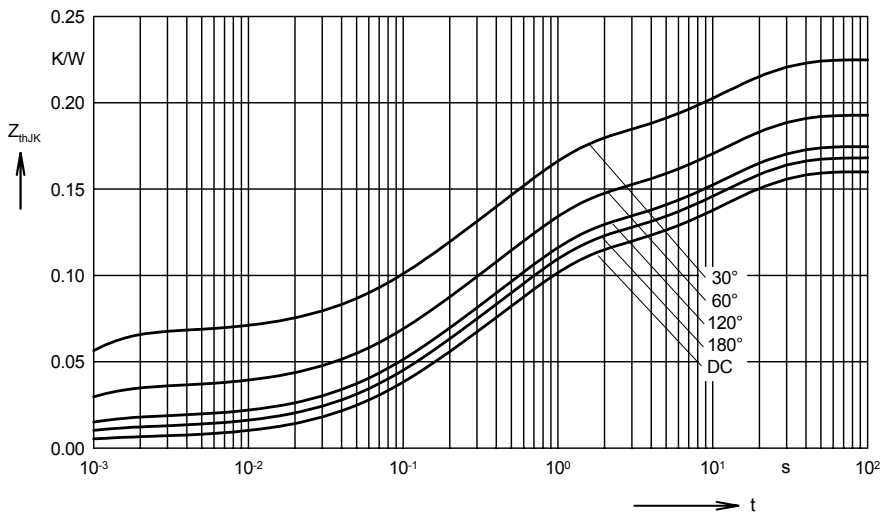


Fig. 9 Transient thermal impedance junction to heatsink (per diode)

R_{thJK} for various conduction angles d:

d	R_{thJK} (K/W)
DC	0.160
180°C	0.168
120°C	0.175
60°C	0.193
30°C	0.225

Constants for Z_{thJK} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.0058	0.00054
2	0.031	0.098
3	0.072	0.54
4	0.0112	12
5	0.04	12