

## Diode Modules

## PSKD 255

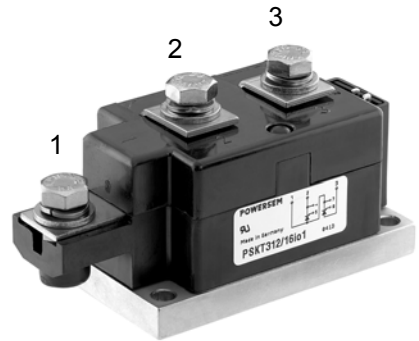
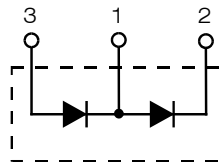
$$I_{FRMS} = 2x 450 A$$

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

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

Preliminary Data Sheet

| $V_{RSM}$<br>V | $V_{RRM}$<br>V | Type        |
|----------------|----------------|-------------|
| 900            | 800            | PSKD 255/08 |
| 1300           | 1200           | PSKD 255/12 |
| 1500           | 1400           | PSKD 255/14 |
| 1700           | 1600           | PSKD 255/16 |
| 1900           | 1800           | PSKD 255/18 |



| Symbol                             | Test Conditions   | Maximum Ratings   |
|------------------------------------|---|---|
| $I_{FRMS}$<br>$I_{FAVM}$           | $T_{VJ} = T_{VJM}$<br>$T_C = 100^\circ C$ ; 180° sine   | 450 A<br>270 A  |
| $I_{FSM}$                          | $T_{VJ} = 45^\circ C$ ;<br>$V_R = 0$                    | t = 10 ms (50 Hz) 9500 A<br>t = 8.3 ms (60 Hz) 10200 A                                    |
|                                    | $T_{VJ} = T_{VJM}$<br>$V_R = 0$                         | t = 10 ms (50 Hz) 8400 A<br>t = 8.3 ms (60 Hz) 9000 A                                     |
| $\int i^2 dt$                      | $T_{VJ} = 45^\circ C$<br>$V_R = 0$                      | t = 10 ms (50 Hz) 451 000 A <sup>2</sup> s<br>t = 8.3 ms (60 Hz) 437 000 A <sup>2</sup> s |
|                                    | $T_{VJ} = T_{VJM}$<br>$V_R = 0$                         | t = 10 ms (50 Hz) 353 000 A <sup>2</sup> s<br>t = 8.3 ms (60 Hz) 340 000 A <sup>2</sup> s |
| $T_{VJ}$<br>$T_{VJM}$<br>$T_{stg}$ |   | -40...+150 °C<br>150 °C<br>-40...+125 °C  |
| $V_{ISOL}$                         | 50/60 Hz, RMS<br>$I_{ISOL} \leq 1 mA$                   | t = 1 min 3000 V~<br>t = 1 s 3600 V~  |
| $M_d$                              | Mounting torque (M6)<br>Terminal connection torque (M8) | 4.5-7/40-62 Nm/lb.in.<br>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                 |
| $V_F$      | $I_F = 600 A$ ; $T_{VJ} = 25^\circ C$                          | 1.4 V                 |
| $V_{T0}$   | For power-loss calculations only                               | 0.8 V                 |
| $r_T$      | $T_{VJ} = T_{VJM}$   | 0.6 mΩ                |
| $R_{thJC}$ | per diode; DC current  | 0.140 K/W<br>0.07 K/W |
|            | per module   |                       |
| $R_{thJK}$ | per diode; DC current  | 0.18 K/W<br>0.09 K/W  |
|            | per module   |                       |
| $Q_S$      | $T_{VJ} = 125^\circ C$ ; $I_F = 400 A$ ; $-di/dt = 50 A/\mu s$ | 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 <sup>2</sup>   |

### 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

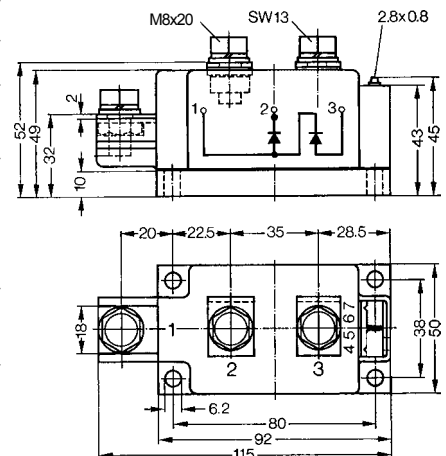
### Applications

- 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")



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

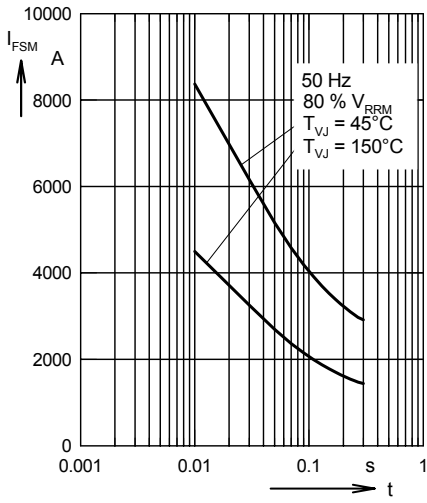


Fig. 1 Surge overload current  
 $I_{FSM}$ : Crest value,  $t$ : duration

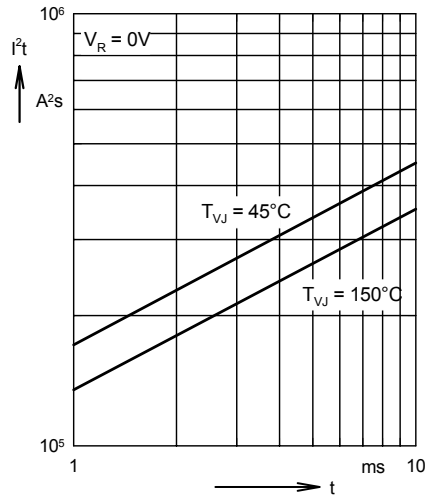


Fig. 2  $I^2t$  versus time (1-10 ms)

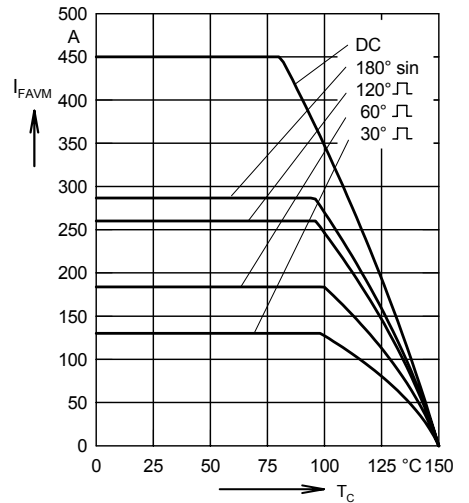


Fig. 3 Maximum forward current at case temperature

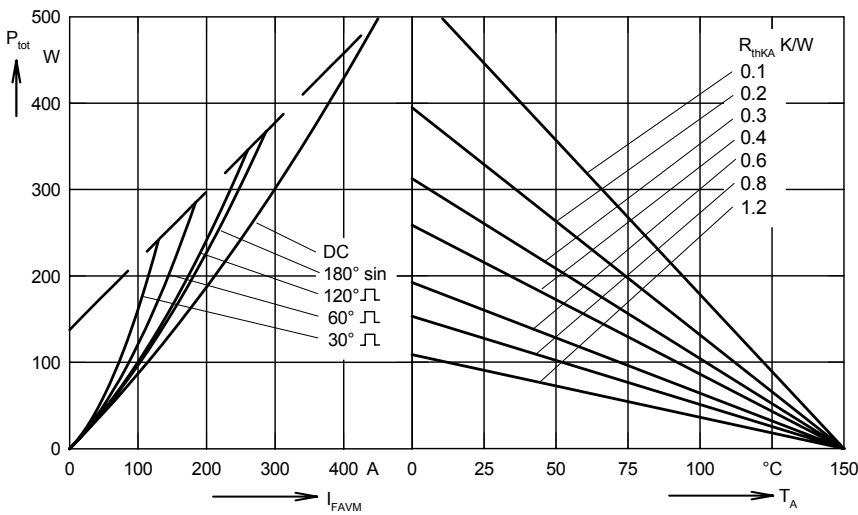


Fig. 4 Power dissipation versus forward current and ambient temperature (per diode)

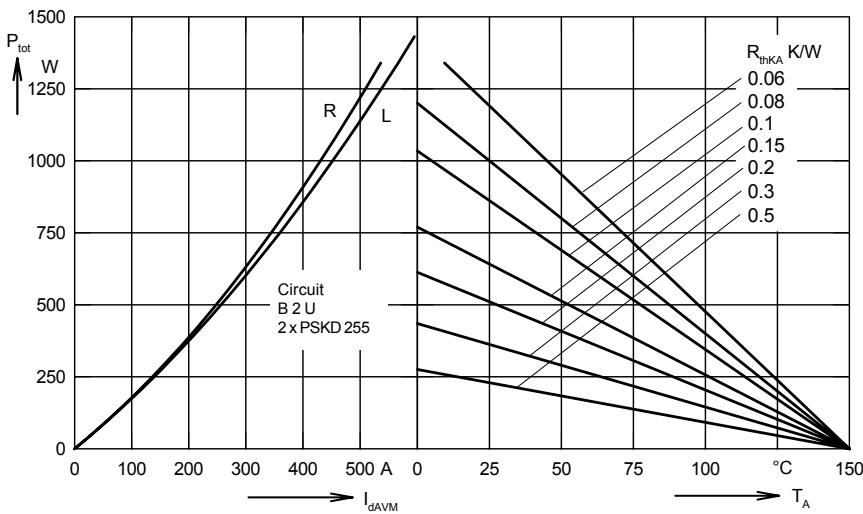


Fig. 5 Single phase rectifier bridge:  
 Power dissipation versus direct output current and ambient temperature  
 R = resistive load  
 L = inductive load

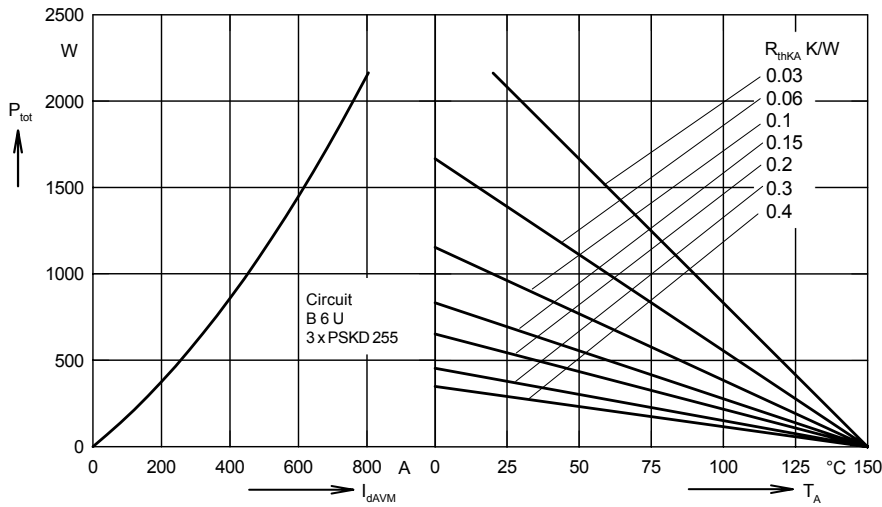


Fig. 6 Three phase rectifier bridge: Power dissipation versus direct output current and ambient temperature

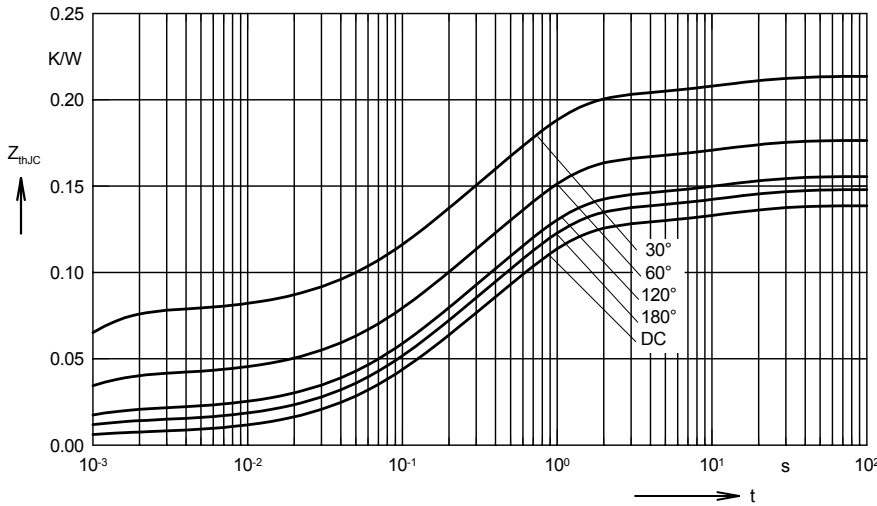


Fig. 7 Transient thermal impedance junction to case (per diode)

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

| d    | $R_{thJC}$ (K/W) |
|------|------------------|
| DC   | 0.139            |
| 180° | 0.148            |
| 120° | 0.156            |
| 60°  | 0.176            |
| 30°  | 0.214            |

Constants for  $Z_{thJC}$  calculation:

| i | $R_{thi}$ (K/W) | $t_i$ (s) |
|---|-----------------|-----------|
| 1 | 0.0066          | 0.00054   |
| 2 | 0.0358          | 0.098     |
| 3 | 0.0831          | 0.54      |
| 4 | 0.0129          | 12        |

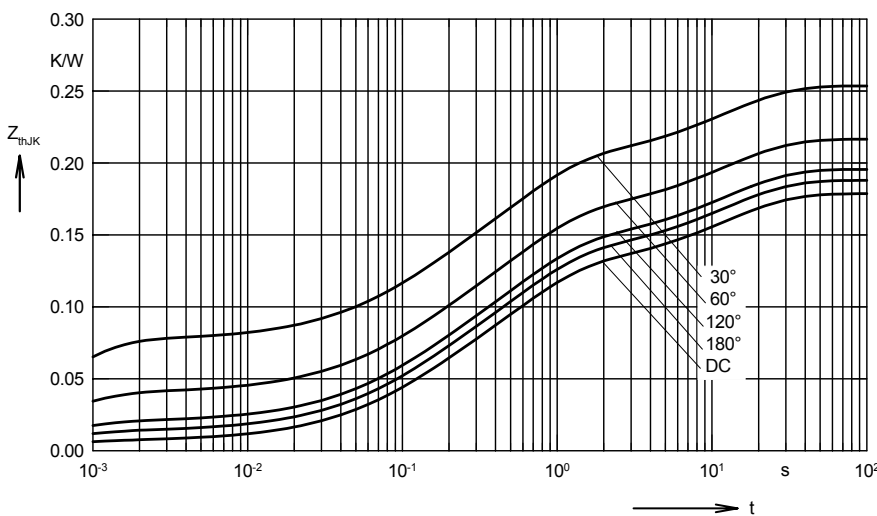


Fig. 8 Transient thermal impedance junction to heatsink (per diode)

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

| d    | $R_{thJK}$ (K/W) |
|------|------------------|
| DC   | 0.179            |
| 180° | 0.188            |
| 120° | 0.196            |
| 60°  | 0.216            |
| 30°  | 0.254            |

Constants for  $Z_{thJK}$  calculation:

| i | $R_{thi}$ (K/W) | $t_i$ (s) |
|---|-----------------|-----------|
| 1 | 0.0066          | 0.00054   |
| 2 | 0.0358          | 0.098     |
| 3 | 0.0831          | 0.54      |
| 4 | 0.0129          | 12        |
| 5 | 0.04            | 12        |