

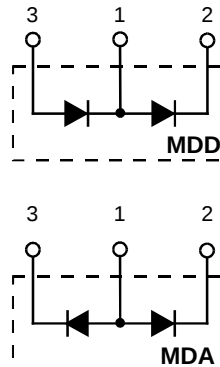
## Diode Modules

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

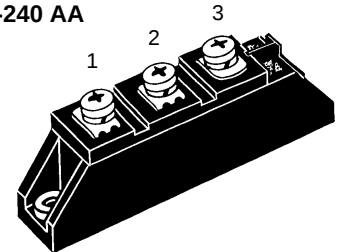
$$I_{FAVM} = 2 \times 113 \text{ A}$$

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

| $V_{RSM}$<br>V | $V_{RRM}$<br>V | Type          |               |
|----------------|----------------|---------------|---------------|
| 900            | 800            | MDD 72-08N1 B | MDA 72-08N1 B |
| 1300           | 1200           | MDD 72-12N1 B | ---           |
| 1500           | 1400           | MDD 72-14N1 B | MDA 72-14N1 B |
| 1700           | 1600           | MDD 72-16N1 B | MDA 72-16N1 B |
| 1900           | 1800           | MDD 72-18N1 B | ---           |



TO-240 AA



| Symbol        | Test Conditions                                   |                                    | Maximum Ratings |                  |
|---------------|---------------------------------------------------|------------------------------------|-----------------|------------------|
| $I_{FRMS}$    | $T_{VJ} = T_{VJM}$                                |                                    | 180             | A                |
| $I_{FAVM}$    | $T_C = 92^\circ\text{C}; 180^\circ \text{ sine}$  |                                    | 113             | A                |
|               | $T_C = 100^\circ\text{C}; 180^\circ \text{ sine}$ |                                    | 99              | A                |
| $I_{FSM}$     | $T_{VJ} = 45^\circ\text{C};$                      | $t = 10 \text{ ms (50 Hz), sine}$  | 1700            | A                |
|               | $V_R = 0$                                         | $t = 8.3 \text{ ms (60 Hz), sine}$ | 1950            | A                |
|               | $T_{VJ} = T_{VJM}$                                | $t = 10 \text{ ms (50 Hz), sine}$  | 1540            | A                |
|               | $V_R = 0$                                         | $t = 8.3 \text{ ms (60 Hz), sine}$ | 1800            | A                |
| $\int i^2 dt$ | $T_{VJ} = 45^\circ\text{C}$                       | $t = 10 \text{ ms (50 Hz), sine}$  | 14 450          | A <sup>2</sup> s |
|               | $V_R = 0$                                         | $t = 8.3 \text{ ms (60 Hz), sine}$ | 15 700          | A <sup>2</sup> s |
|               | $T_{VJ} = T_{VJM}$                                | $t = 10 \text{ ms (50 Hz), sine}$  | 11 850          | A <sup>2</sup> s |
|               | $V_R = 0$                                         | $t = 8.3 \text{ ms (60 Hz), sine}$ | 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                                     | $t = 1 \text{ min}$                | 3000            | V~               |
|               | $I_{ISOL} \leq 1 \text{ mA}$                      | $t = 1 \text{ s}$                  | 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  $\text{Al}_2\text{O}_3$ -ceramic base plate
- Planar passivated chips
- Isolation voltage 3600 V~
- UL registered, E 72873

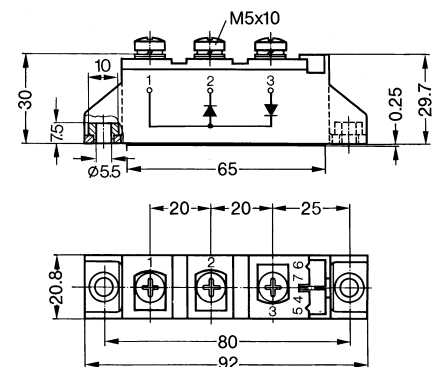
### Applications

- 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                                                              | 0.35                  | K/W              |
|            | per module                                                                         | 0.175                 | K/W              |
|            | per diode; DC current                                                              | 0.55                  | K/W              |
|            | per module                                                                         | 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 diode unless otherwise stated.  
 IXYS reserves the right to change limits, test conditions and dimensions

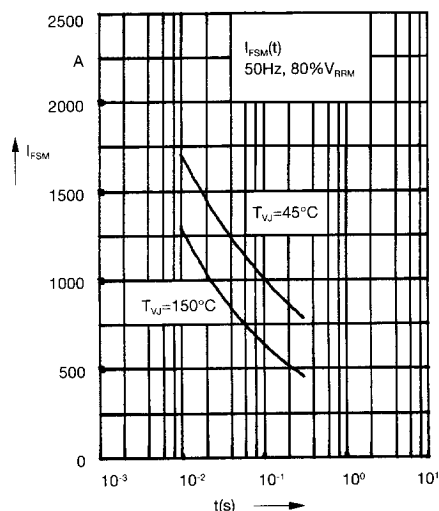


Fig. 1 Surge overload current  
 $I_{FSM}$ : Crest value,  $t$ : duration

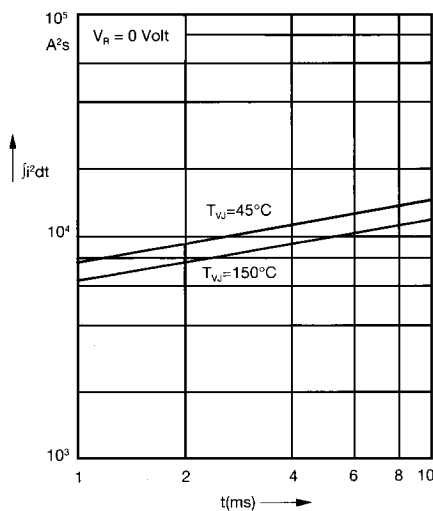


Fig. 2  $j^2dt$  versus time (1-10 ms)

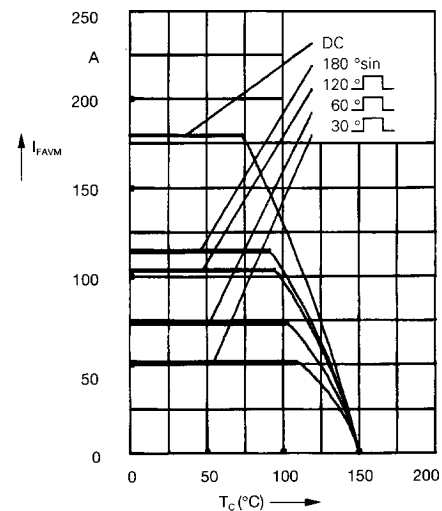


Fig. 2a Maximum forward current  
at case temperature

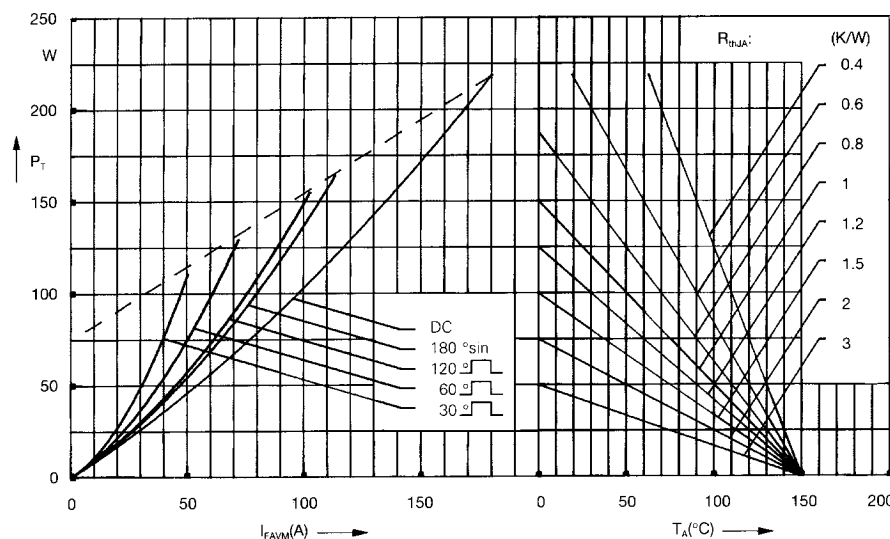


Fig. 3 Power dissipation versus  
forward current and ambient  
temperature (per diode)

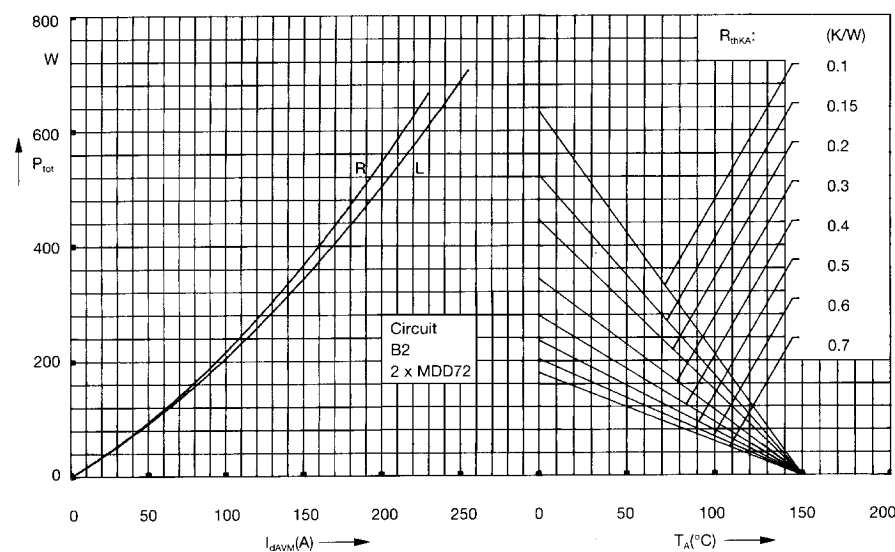


Fig. 4 Single phase rectifier bridge:  
Power dissipation versus direct  
output current and ambient  
temperature  
R = resistive load  
L = inductive load

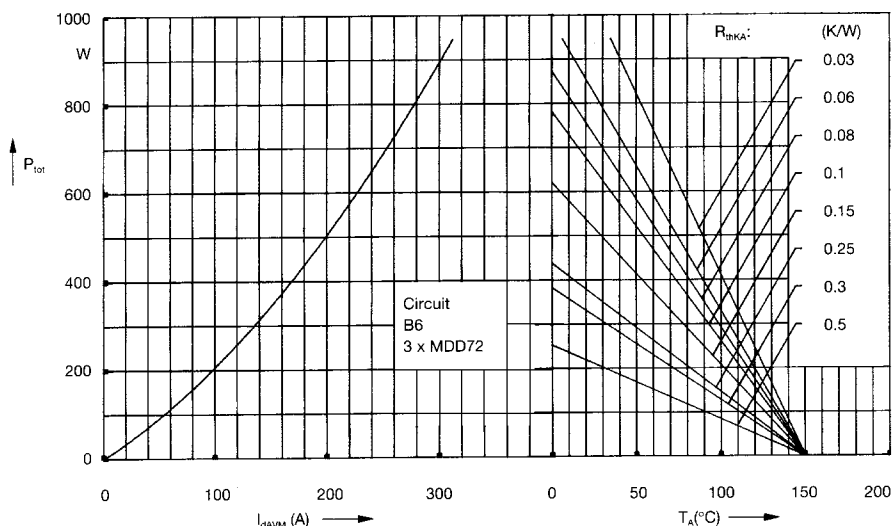


Fig. 5 Three phase rectifier bridge:  
Power dissipation versus direct  
output current and ambient  
temperature

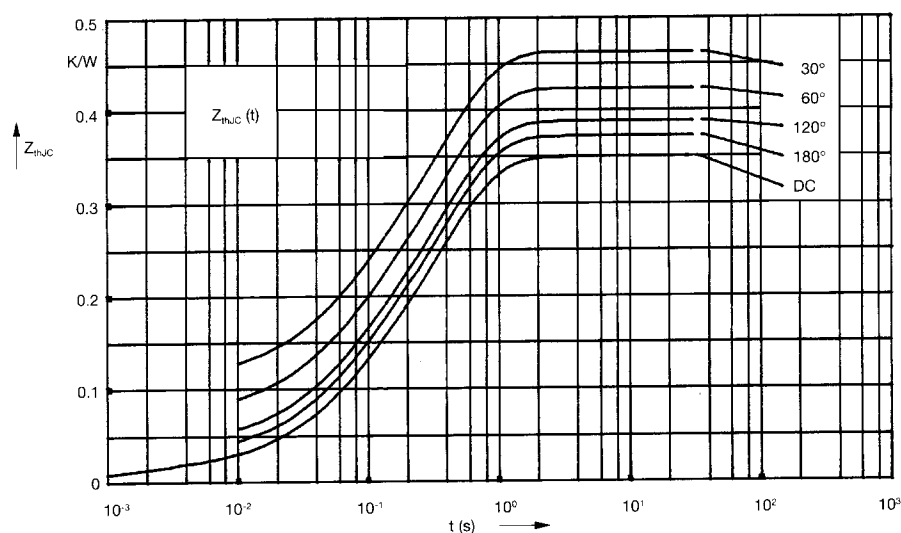


Fig. 6 Transient thermal impedance  
junction to case (per diode)

$R_{thJC}$  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     |

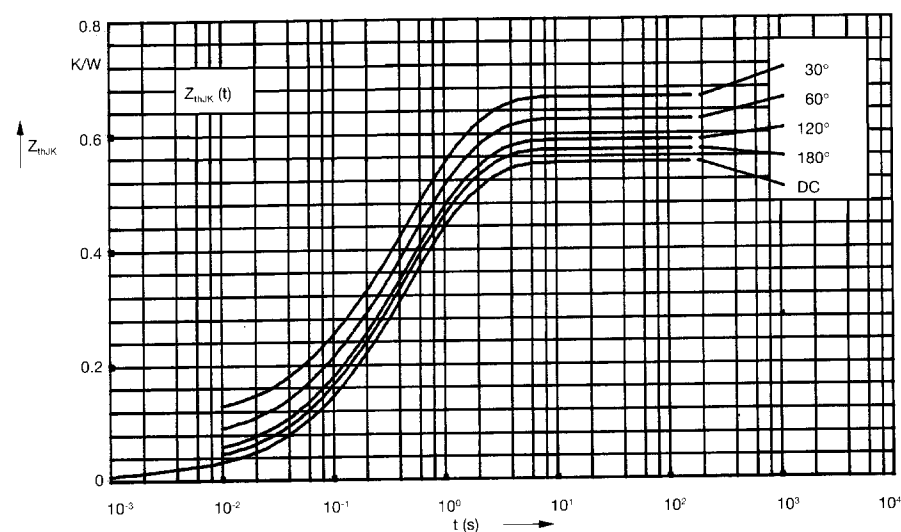


Fig. 7 Transient thermal impedance  
junction to heatsink (per diode)

$R_{thJK}$  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      |