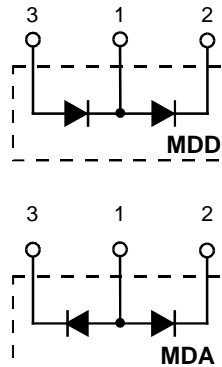
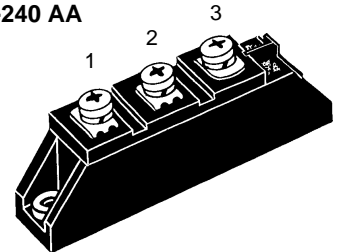


# Diode Modules

$I_{FRMS} = 2 \times 180 \text{ A}$   
 $I_{FAVM} = 2 \times 113 \text{ A}$   
 $V_{RRM} = 800-1800 \text{ V}$

| $V_{RSM}$<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                     |                         |
| $I_{FSM}$     | $T_{VJ} = 45^\circ\text{C}; V_R = 0$              | 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 <sup>2</sup> s |
|               |   | t = 8.3 ms (60 Hz), sine | 15 700 A <sup>2</sup> s |
|               | $T_{VJ} = T_{VJM}; V_R = 0$                       | t = 10 ms (50 Hz), sine  | 11 850 A <sup>2</sup> s |
|               |   | t = 8.3 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 min                | 3000 V~                 |
|               | $I_{ISOL} \leq 1 \text{ mA}$                      | t = 1 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**

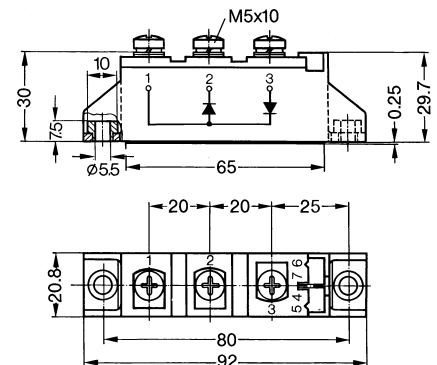
- International standard package JEDEC TO-240 AA
- Direct copper bonded  $\text{Al}_2\text{O}_3$  -ceramic base plate
- Planar passivated chips
- Isolation voltage 3600 V~
- UL registered, E 72873

**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<br>per module<br>per diode; DC current<br>per module         | } other values<br>see Fig. 6/7 | 0.35 K/W  |
|            |  |                                | 0.175 K/W |
|            |  |                                | 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 <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

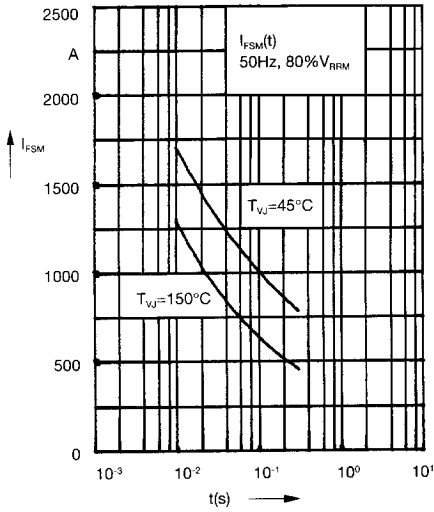


Fig. 1 Surge overload current  
 $I_{FSM}$ : Crest value, t: duration

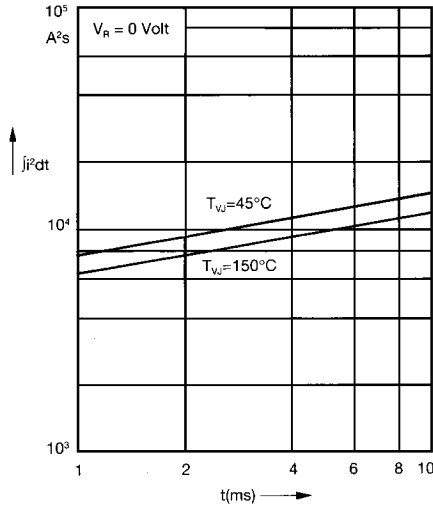


Fig. 2  $j_i^2 dt$  versus time (1-10 ms)

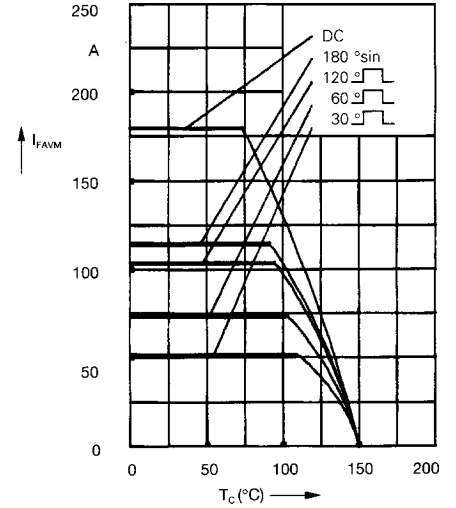


Fig. 2a Maximum forward current at case temperature

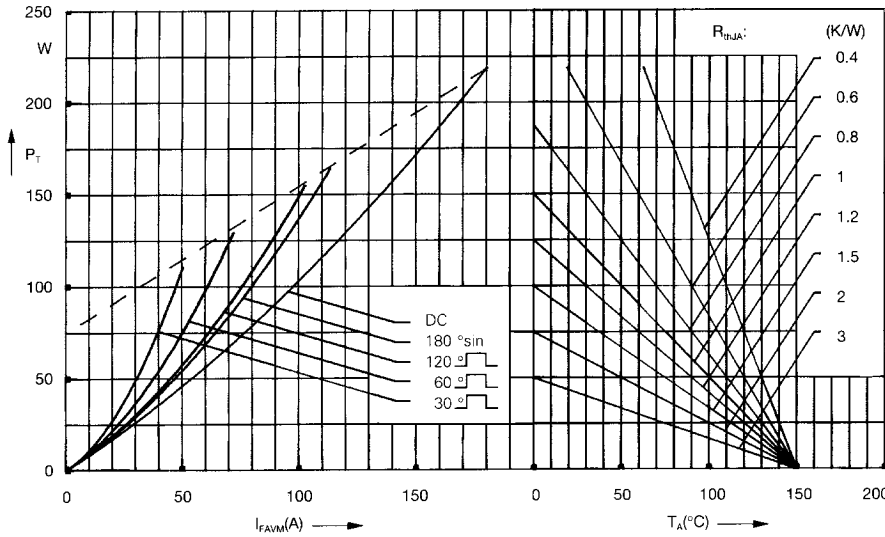


Fig. 3 Power dissipation versus forward current and ambient temperature (per diode)

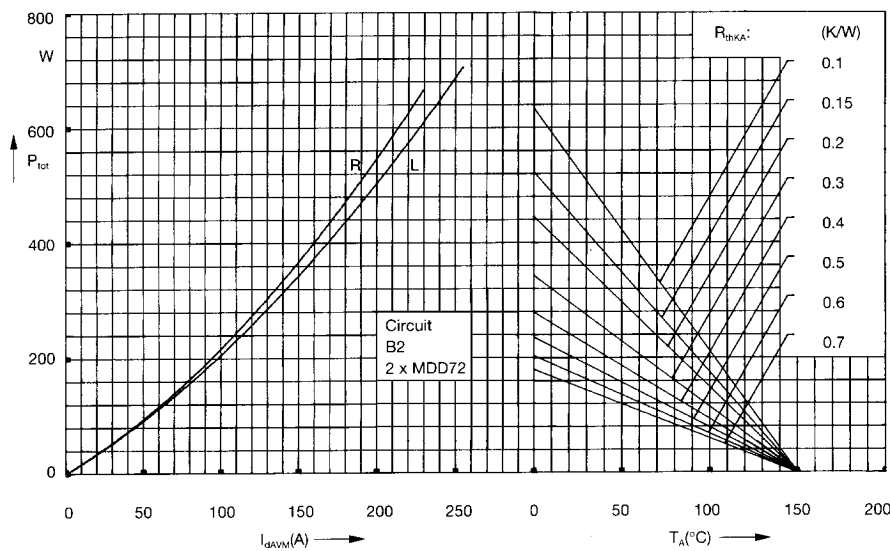


Fig. 4 Single phase rectifier bridge:  
Power dissipation versus direct output current and ambient temperature  
R = resistive load  
L = inductive load

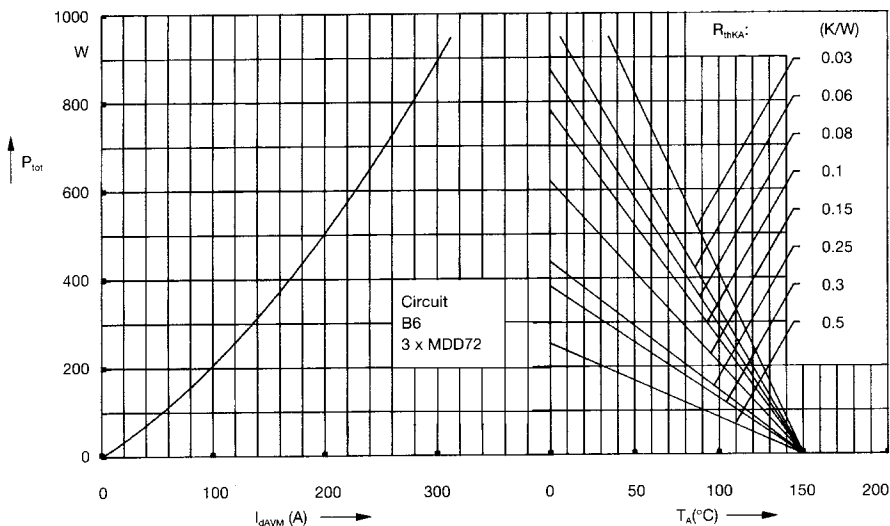


Fig. 5 Three phase rectifier bridge: Power dissipation versus direct output current and ambient temperature

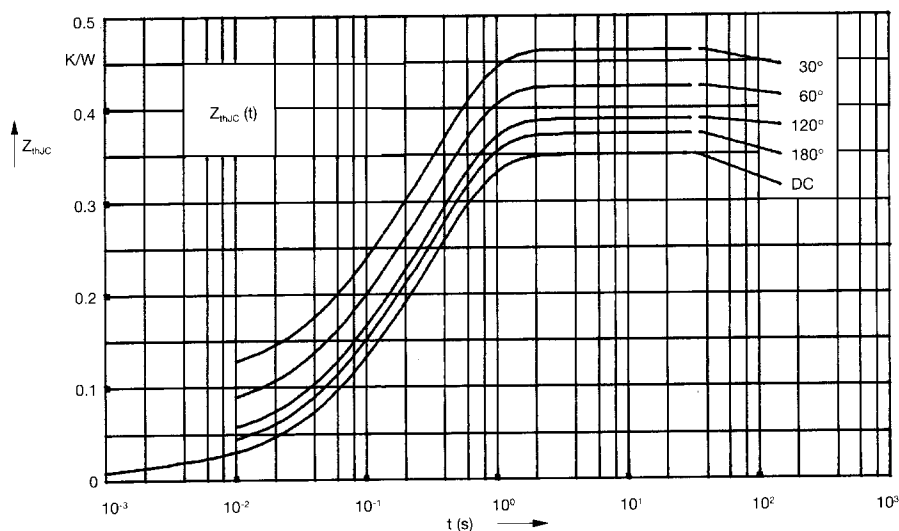


Fig. 6 Transient thermal impedance junction to case (per diode)

$R_{thJC}$  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     |

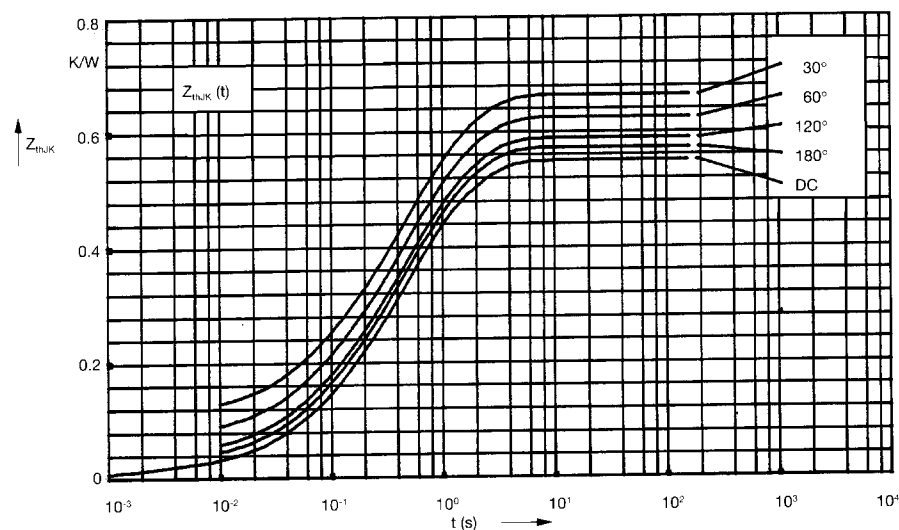


Fig. 7 Transient thermal impedance junction to heatsink (per diode)

$R_{thJK}$  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      |