

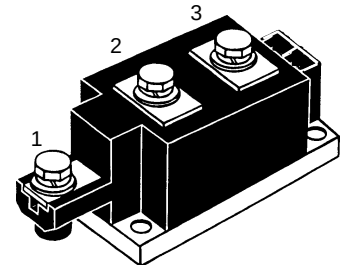
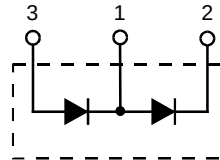
## High Power Diode Modules

$$I_{FRMS} = 2 \times 450 \text{ A}$$

$$I_{FAVM} = 2 \times 270 \text{ A}$$

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

| $V_{RSM}$<br>$V_{DSM}$<br>V | $V_{RRM}$<br>$V_{DRM}$<br>V | Type         |
|-----------------------------|-----------------------------|--------------|
| 1300                        | 1200                        | MDD 255-12N1 |
| 1500                        | 1400                        | MDD 255-14N1 |
| 1700                        | 1600                        | MDD 255-16N1 |
| 1900                        | 1800                        | MDD 255-18N1 |
| 2100                        | 2000                        | MDD 255-20N1 |
| 2300                        | 2200                        | MDD 255-22N1 |



| Symbol        | Test Conditions                                                                      | Maximum Ratings                                                                                               |
|---------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| $I_{FRMS}$    | $T_{VJ} = T_{VJM}$                                                                   | 450 A                                                                                                         |
| $I_{FAVM}$    | $T_C = 100^\circ\text{C}; 180^\circ \text{ sine}$                                    | 270 A                                                                                                         |
| $I_{FSM}$     | $T_{VJ} = 45^\circ\text{C};$<br>$V_R = 0$                                            | $t = 10 \text{ ms (50 Hz)}$ 9500 A<br>$t = 8.3 \text{ ms (60 Hz)}$ 10200 A                                    |
|               | $T_{VJ} = T_{VJM}$<br>$V_R = 0$                                                      | $t = 10 \text{ ms (50 Hz)}$ 8400 A<br>$t = 8.3 \text{ ms (60 Hz)}$ 9000 A                                     |
| $\int i^2 dt$ | $T_{VJ} = 45^\circ\text{C}$<br>$V_R = 0$                                             | $t = 10 \text{ ms (50 Hz)}$ 451 000 A <sup>2</sup> s<br>$t = 8.3 \text{ ms (60 Hz)}$ 437 000 A <sup>2</sup> s |
|               | $T_{VJ} = T_{VJM}$<br>$V_R = 0$                                                      | $t = 10 \text{ ms (50 Hz)}$ 353 000 A <sup>2</sup> s<br>$t = 8.3 \text{ ms (60 Hz)}$ 340 000 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<br>$I_{ISOL} \leq 1 \text{ mA}$                                        | $t = 1 \text{ min}$ 3000 V~<br>$t = 1 \text{ s}$ 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                                                                                                         |
| $V_F$         | $I_F = 600 \text{ A}; T_{VJ} = 25^\circ\text{C}$                                     | 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                                                                                                     |
| $R_{thJK}$    | per module                                                                           | 0.07 K/W                                                                                                      |
|               | per diode; DC current                                                                | 0.18 K/W                                                                                                      |
|               | per module                                                                           | 0.09 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 <sup>2</sup>                                                                                           |

### Features

- International standard package
- Direct copper bonded Al<sub>2</sub>O<sub>3</sub>-ceramic with copper base plate
- Planar passivated chips
- Isolation voltage 3600 V~
- UL registered E 72873

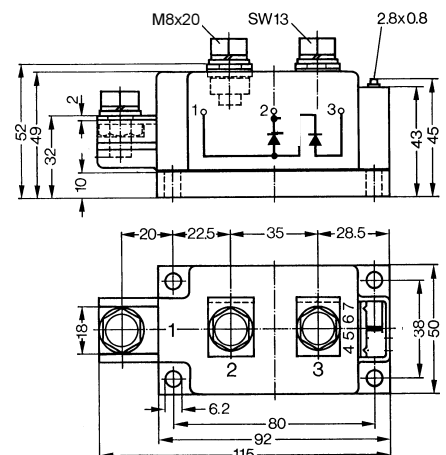
### Applications

- Supplies for DC power equipment
- DC supply for PWM inverter
- Field supply for DC motors
- Battery DC power supplies

### Advantages

- 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 diode unless otherwise stated.  
IXYS reserves the right to change limits, test conditions and dimensions

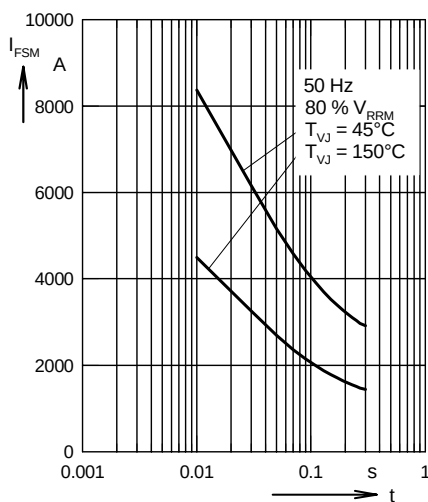


Fig. 1 Surge overload current  
 $I_{FSM}$ : Crest value,  $t$ : duration

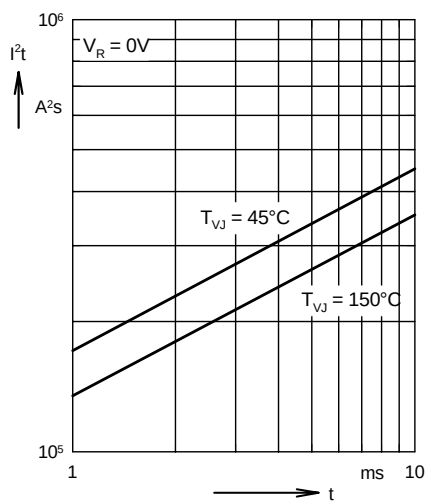


Fig. 2  $I^2t$  versus time (1-10 ms)

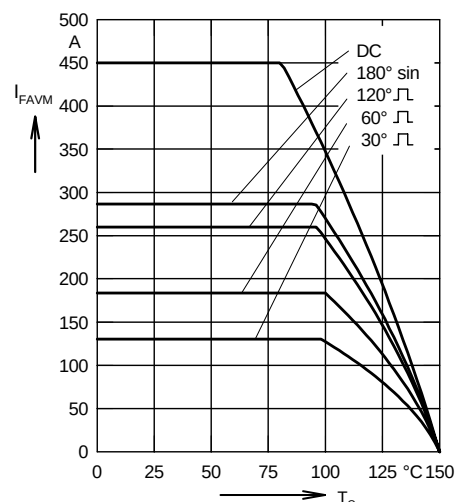


Fig. 3 Maximum forward current at case temperature

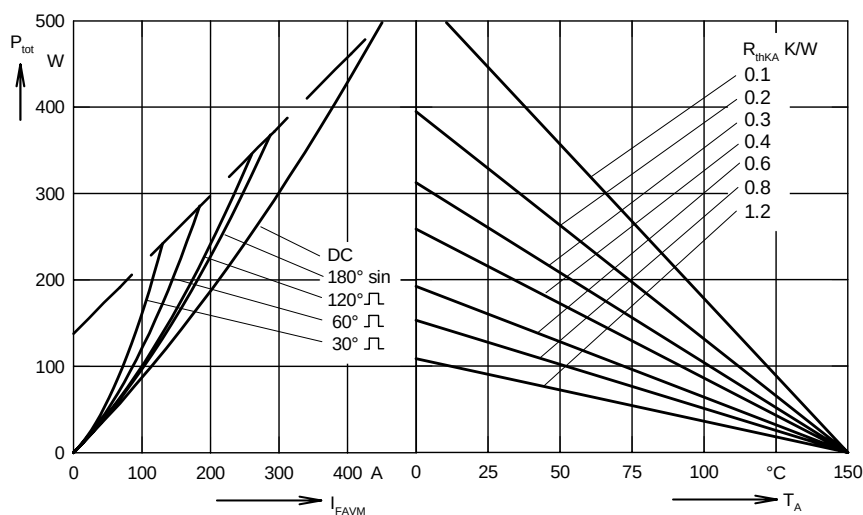


Fig. 4 Power dissipation versus forward current and ambient temperature (per diode)

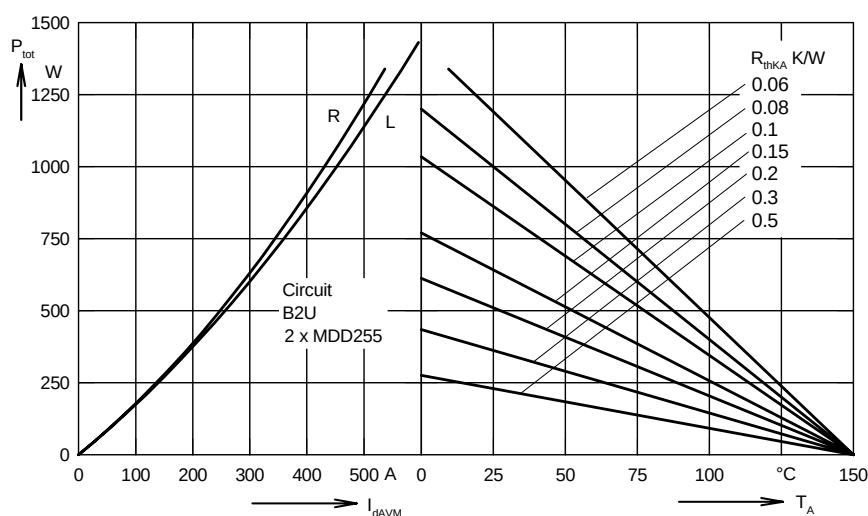


Fig. 5 Single phase rectifier bridge:  
Power dissipation versus direct output current and ambient temperature  
R = resistive load  
L = inductive load

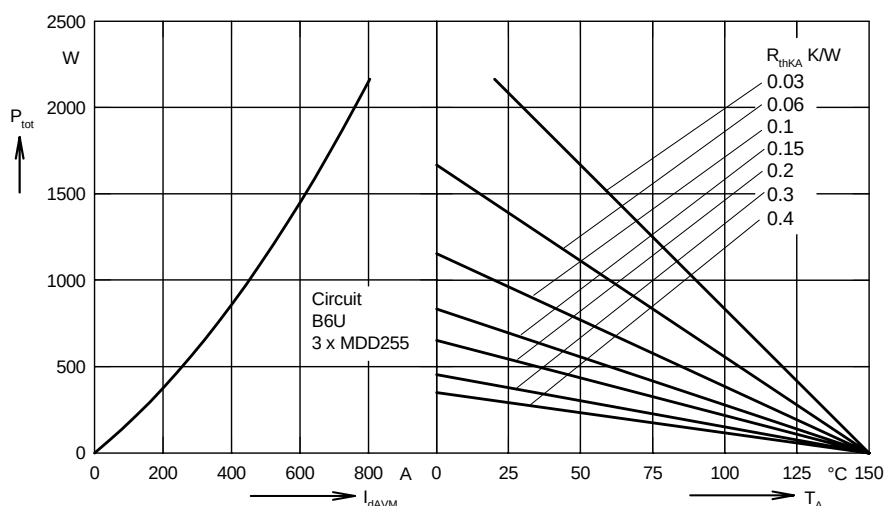


Fig. 6 Three phase rectifier bridge:  
Power dissipation versus direct  
output current and ambient  
temperature

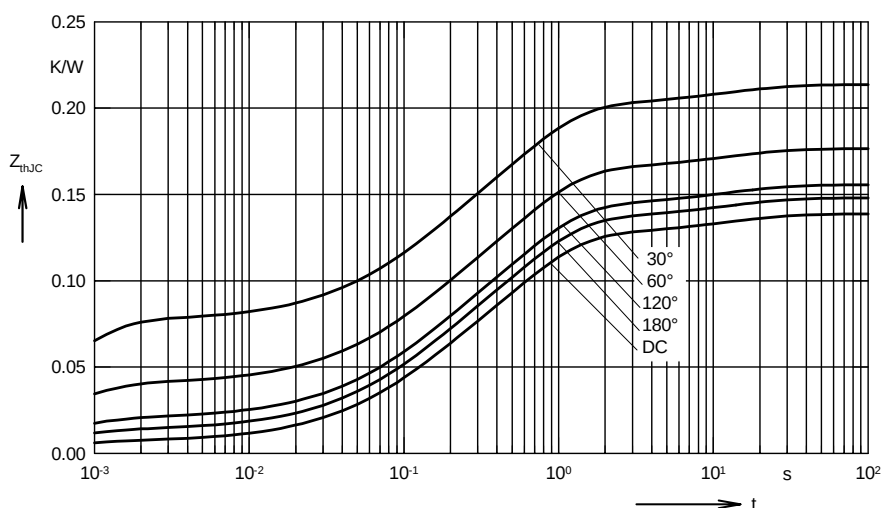


Fig. 7 Transient thermal impedance  
junction to case (per diode)

$R_{thJC}$  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        |

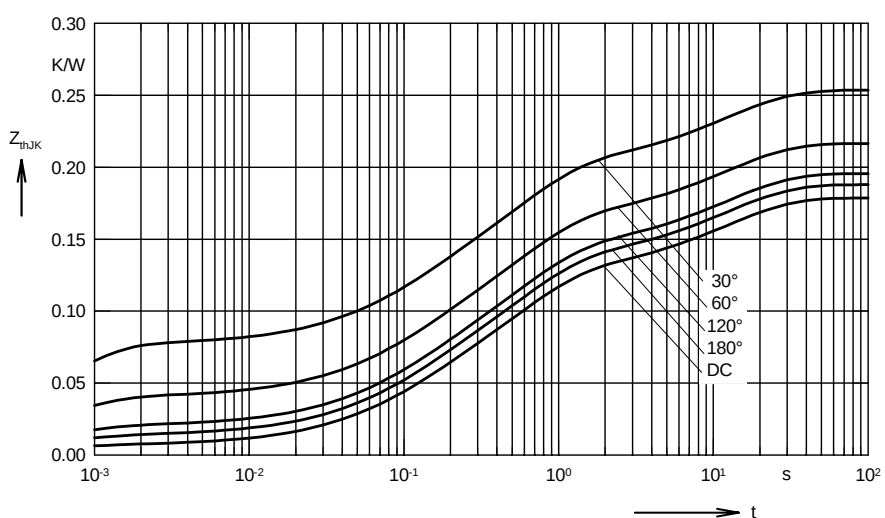


Fig. 8 Transient thermal impedance  
junction to heatsink (per diode)

$R_{thJK}$  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        |

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