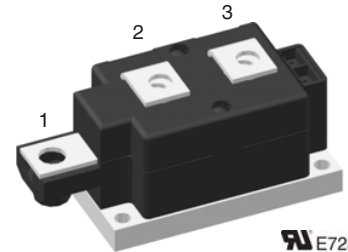
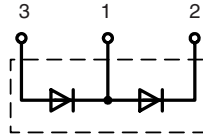


High Power Diode Modules

$I_{FRMS} = 2 \times 520 \text{ A}$
 $I_{FAVM} = 2 \times 310 \text{ A}$
 $V_{RRM} = 1200-2200 \text{ V}$

| V_{RSM} V | V_{RRM} V | Type |
|----------------|----------------|--------------|
| 1300 | 1200 | MDD 312-12N1 |
| 1500 | 1400 | MDD 312-14N1 |
| 1700 | 1600 | MDD 312-16N1 |
| 1900 | 1800 | MDD 312-18N1 |
| 2100 | 2000 | MDD 312-20N1 |
| 2300 | 2200 | MDD 312-22N1 |



UL E72873

| Symbol | Conditions | Maximum Ratings | |
|---------------|---------------------------------------------------|------------------------------|--------------------------|
| I_{FRMS} | $T_{VJ} = T_{VJM}$ | 520 | A |
| I_{FAVM} | $T_C = 100^\circ\text{C}; 180^\circ \text{ sine}$ | 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 |
| | $T_{VJ} = T_{VJM}; V_R = 0$ | $t = 10 \text{ ms (50 Hz)}$ | 9200 A |
| | | $t = 8.3 \text{ ms (60 Hz)}$ | 9800 A |
| $\int i^2 dt$ | $T_{VJ} = 45^\circ\text{C}; V_R = 0$ | $t = 10 \text{ ms (50 Hz)}$ | 551000 A ² s |
| | | $t = 8.3 \text{ ms (60 Hz)}$ | 527000 A ² s |
| | $T_{VJ} = T_{VJM}; V_R = 0$ | $t = 10 \text{ ms (50 Hz)}$ | 423 000 A ² s |
| | | $t = 8.3 \text{ ms (60 Hz)}$ | 403 000 A ² s |
| T_{VJ} | | -40...+150 | °C |
| T_{VJM} | | 150 | °C |
| T_{stg} | | -40...+125 | °C |
| 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) | 4.5-7/40-62 | Nm/lb.in. |
| | Terminal connection torque (M8) | 11-13/97-115 | Nm/lb.in. |
| Weight | Typical including screws | 750 | g |

Features

- International standard package
- Direct copper bonded Al₂O₃-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

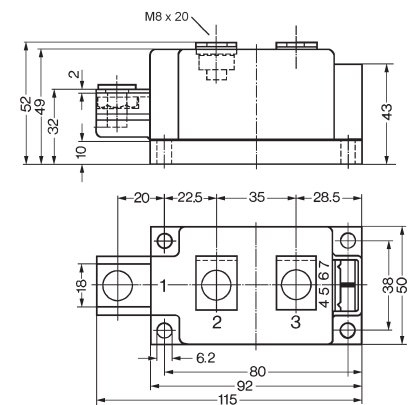
Advantages

- Simple mounting
- Improved temperature and power cycling
- Reduced protection circuits

| Symbol | 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_{TO} | For power-loss calculations only | 0.8 | V |
| r_T | $T_{VJ} = T_{VJM}$ | 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 |

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

Dimensions in mm (1 mm = 0.0394")



Optional accessories for modules
 Keyed Gate/Cathode twin plugs with wire length = 350 mm, gate = yellow, cathode = red
 Type ZY 180 L (L = Left for pin pair 4/5) } UL 758, style 1385,
 Type ZY 180 R (R = Right for pin pair 6/7) } CSA class 5851, guide 480-1-1

IXYS reserves the right to change limits, test conditions and dimensions.

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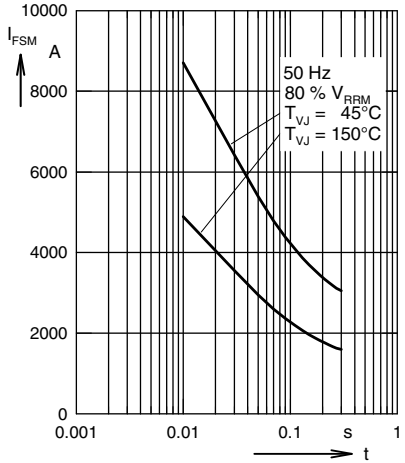


Fig. 1 Surge overload current
 I_{FSM} : Crest value, t : duration

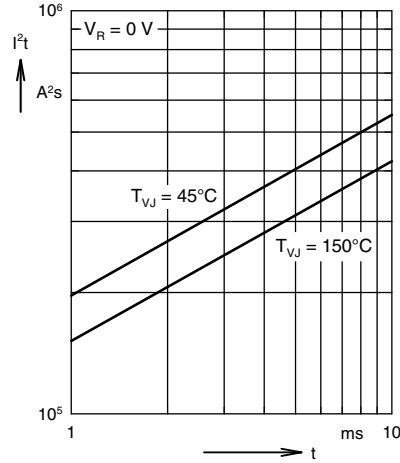


Fig. 2 I^2t versus time (1-10 ms)

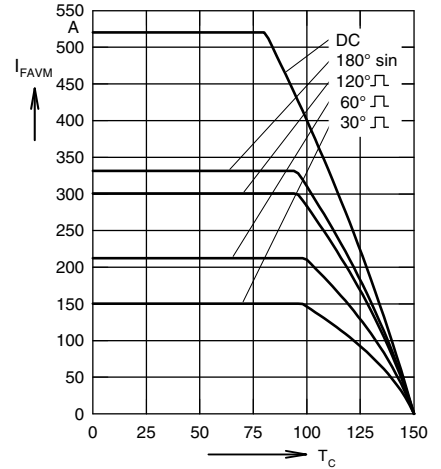


Fig. 3 Maximum forward current at case temperature

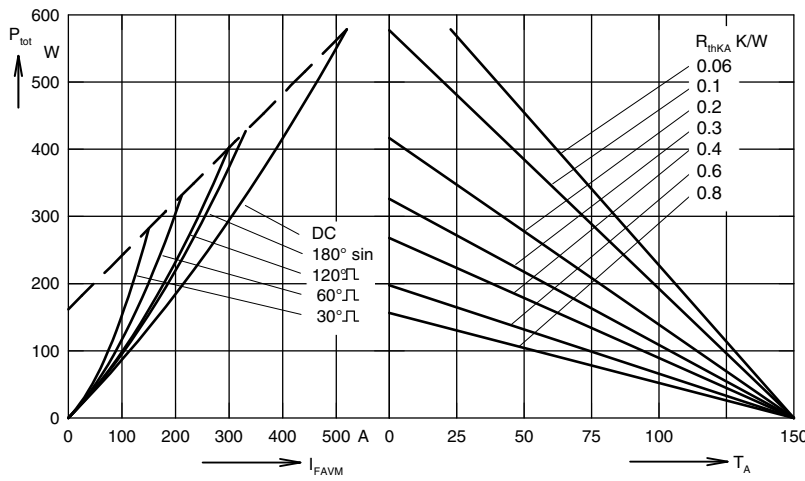


Fig. 4 Power dissipation vs. forward current and ambient temperature (per diode)

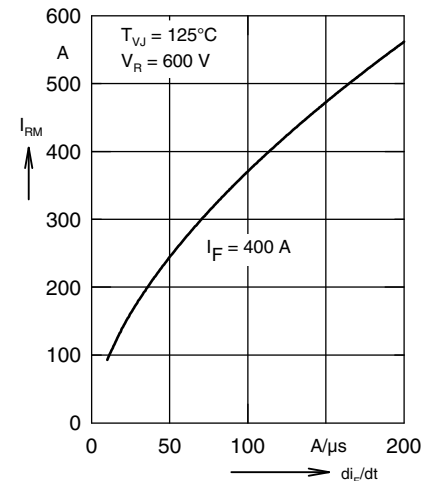


Fig. 5 Typ. peak reverse current I_{RM} versus $-di_p/dt$

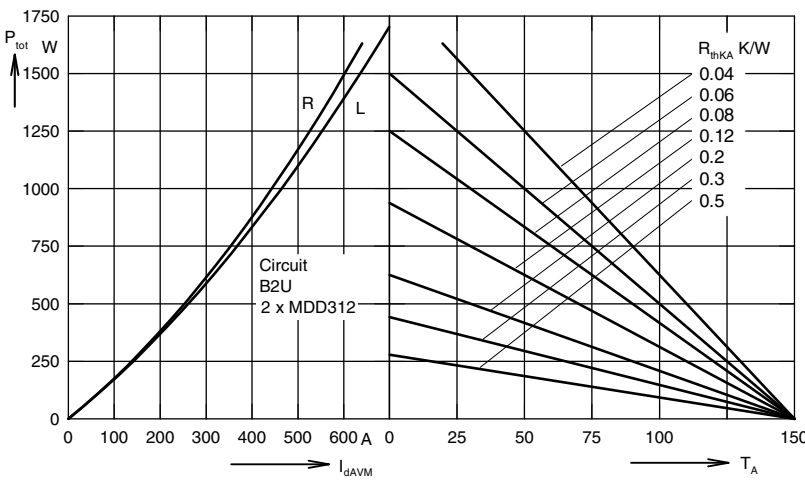


Fig. 6 Single phase rectifier bridge: Power dissipation vs. direct output current and ambient temperature R = resistive load, L = inductive load

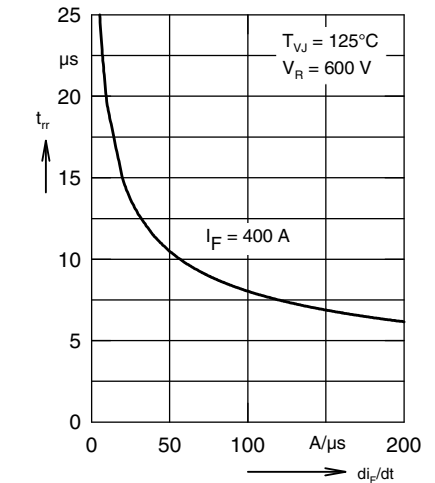


Fig. 7 Typ. recovery time t_{rr} versus $-di_p/dt$

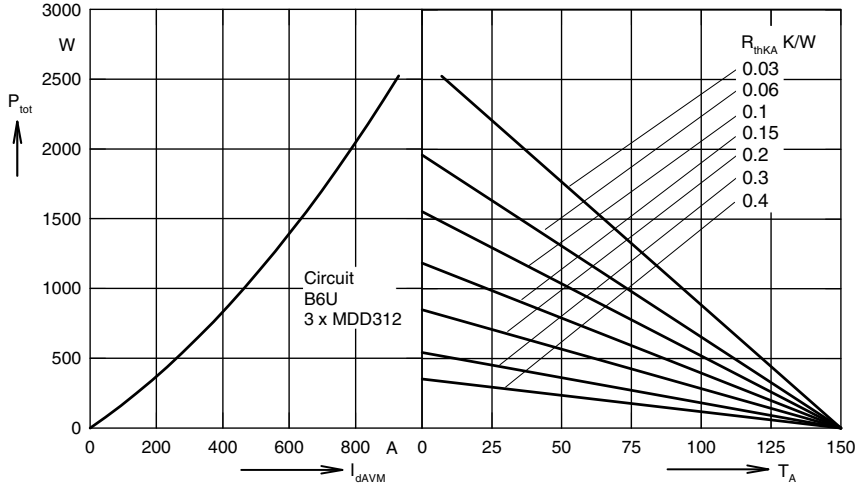
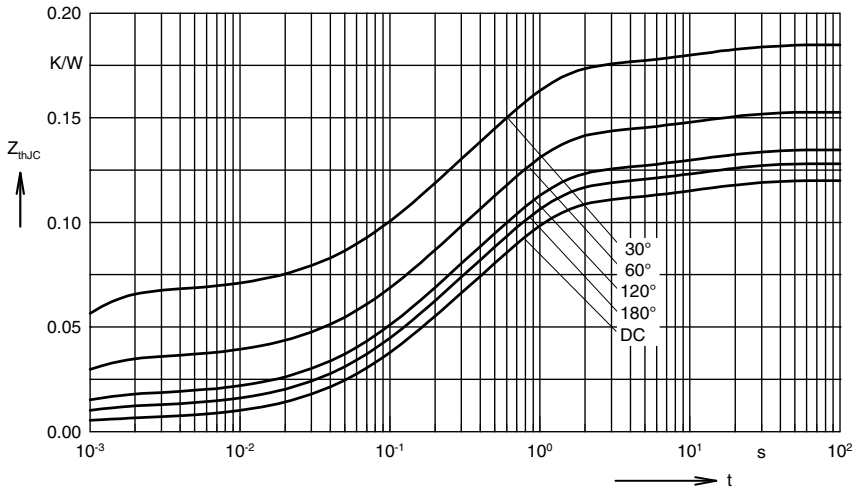


Fig. 8 Three phase rectifier bridge: Power dissipation versus direct output current and ambient temperature



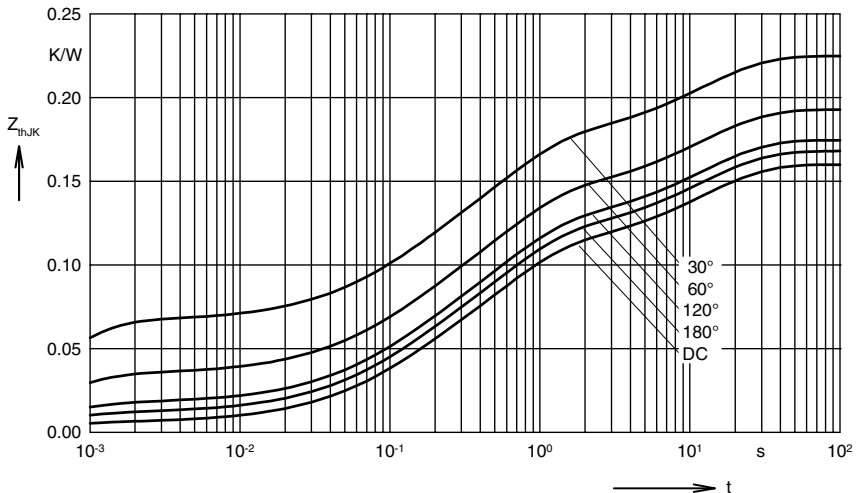
R_{thJC} for various conduction angles d:

| 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 case (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 |

Fig. 10 Transient thermal impedance junction to heatsink (per diode)