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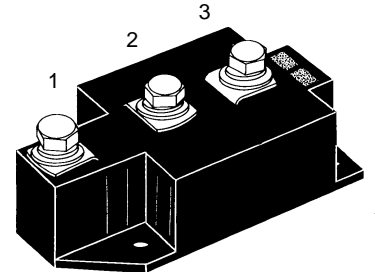
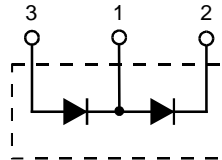
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# High Power Diode Modules

$I_{FRMS} = 2 \times 480 \text{ A}$   
 $I_{FAVM} = 2 \times 305 \text{ A}$   
 $V_{RRM} = 800\text{-}2200 \text{ V}$

$V_{RSM}$ V	$V_{RRM}$ V	Type
900	800	MDD 310-08N1
1300	1200	MDD 310-12N1
1500	1400	MDD 310-14N1
1700	1600	MDD 310-16N1
2100	2000	MDD 310-20N1
2300	2200	MDD 310-22N1



Symbol	Test Conditions	Maximum Ratings
$I_{FRMS}$	$T_{VJ} = T_{VJM}$	480 A
$I_{FAVM}$	$T_C = 100^\circ\text{C}; 180^\circ \text{ sine}$	305 A
$I_{FSM}$	$T_{VJ} = 45^\circ\text{C}; V_R = 0$	t = 10 ms (50 Hz), sine 11 500 A
		t = 8.3 ms (60 Hz), sine 12 200 A
	$T_{VJ} = T_{VJM}; V_R = 0$	t = 10 ms (50 Hz), sine 9 600 A
		t = 8.3 ms (60 Hz), sine 10 200 A
$\int i^2 dt$	$T_{VJ} = 45^\circ\text{C}; V_R = 0$	t = 10 ms (50 Hz), sine 662 000 A <sup>2</sup> s
		t = 8.3 ms (60 Hz), sine 620 000 A <sup>2</sup> s
	$T_{VJ} = T_{VJM}; V_R = 0$	t = 10 ms (50 Hz), sine 460 000 A <sup>2</sup> s
		t = 8.3 ms (60 Hz), sine 430 000 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 t = 1 min	3000 V~
	$I_{ISOL} \leq 1 \text{ mA}$ t = 1 s	3600 V~
$M_d$	Mounting torque (M5)	2.5-5/22-44 Nm/lb.in.
	Terminal connection torque (M8)	12-15/106-132 Nm/lb.in.
Weight	Typical including screws	320 g

### 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 72873

### Applications

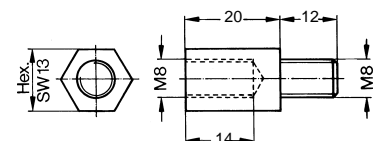
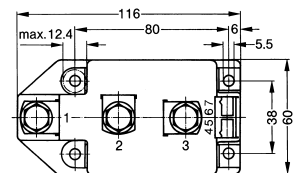
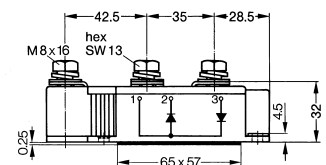
- Supplies for DC power equipment
- DC supply for PWM inverter
- Field supply for DC motors
- Battery DC power supplies

### Advantages

- Space and weight savings
- Simple mounting
- Improved temperature and power cycling
- Reduced protection circuits

Symbol	Test Conditions	Characteristic Values
$I_{RRM}$	$T_{VJ} = T_{VJM}; V_R = V_{RRM}$	40 mA
$V_F$	$I_F = 600 \text{ A}; T_{VJ} = 25^\circ\text{C}$	1.2 V
$V_{T0}$	For power-loss calculations only	0.75 V
$r_T$	$T_{VJ} = T_{VJM}$	0.63 mΩ
$R_{thJC}$	per diode; DC current	0.129 K/W
$R_{thJK}$	per module	0.065 K/W
	per diode; DC current	0.169 K/W
	per module	0.0845 K/W
$Q_S$	$T_{VJ} = 125^\circ\text{C}; I_F = 400 \text{ A}; -di/dt = 50 \text{ A}/\mu\text{s}$	760 μC
$I_{RM}$		275 A
$d_S$	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>

### 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

Threaded spacer for higher Anode/Cathode construction: Type ZY 250, material brass

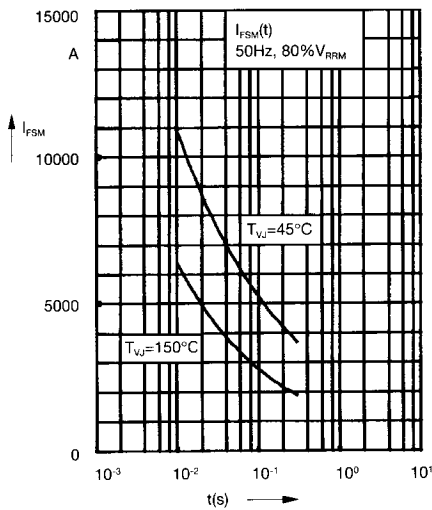


Fig. 1 Surge overload current  
 $I_{FSM}$ : Crest value, t: duration

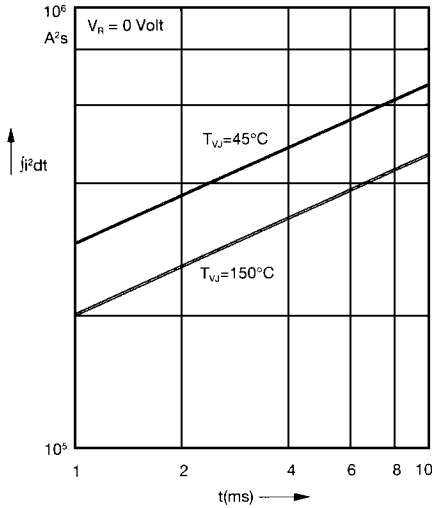


Fig. 2  $\int i^2 dt$  versus time (1-10 ms)

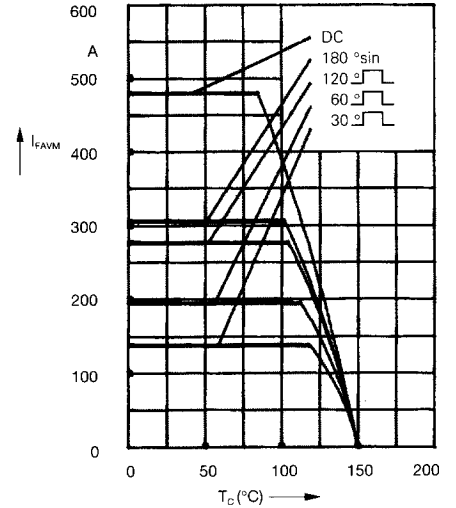


Fig. 2a Maximum forward current at case temperature

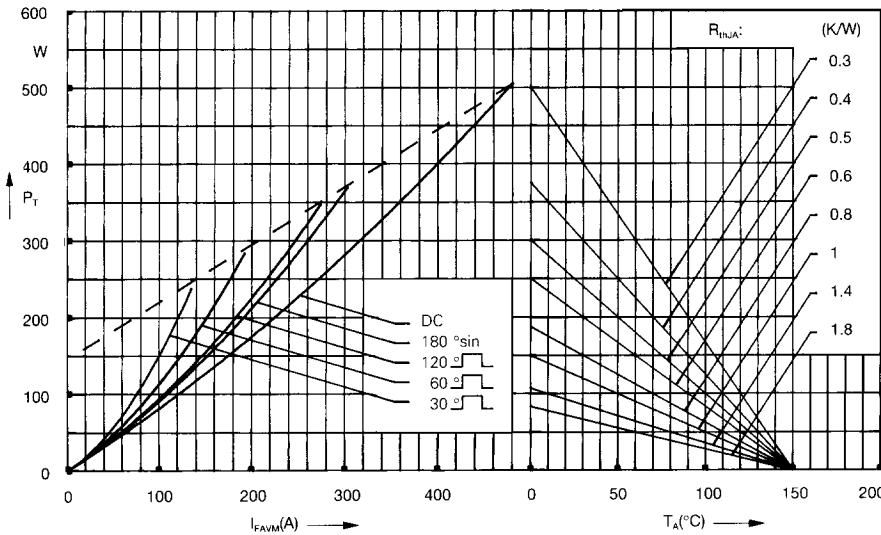


Fig. 3 Power dissipation versus forward current and ambient temperature (per diode)

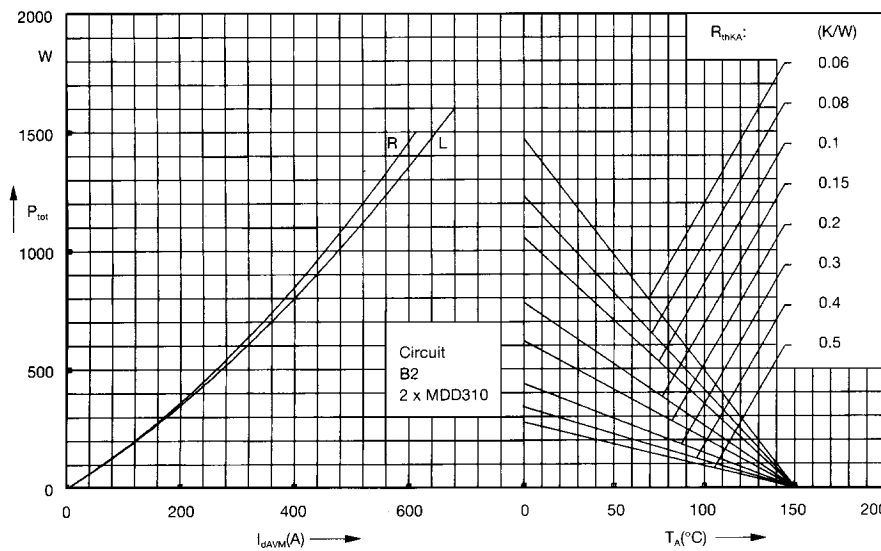


Fig. 4 Single phase rectifier bridge:  
 Power dissipation versus direct output current and ambient temperature  
 R = resistive load  
 L = inductive load

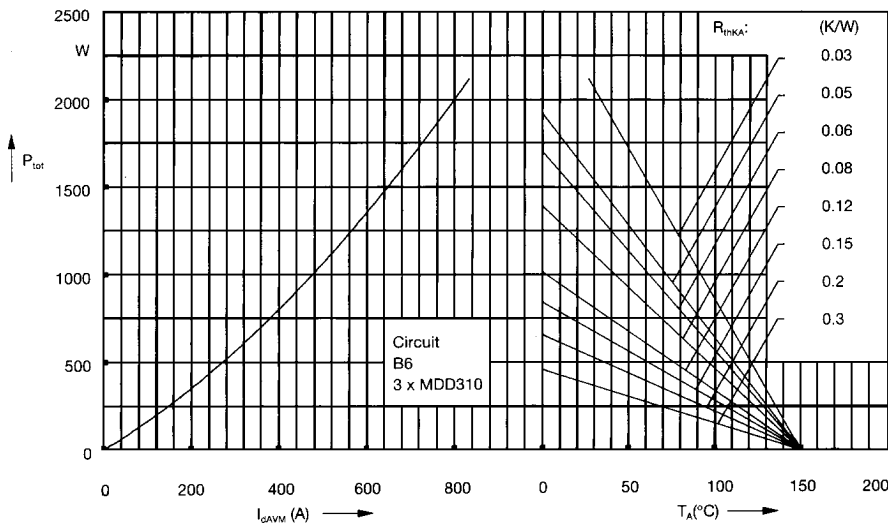


Fig. 5 Three phase rectifier bridge: Power dissipation versus direct output current and ambient temperature

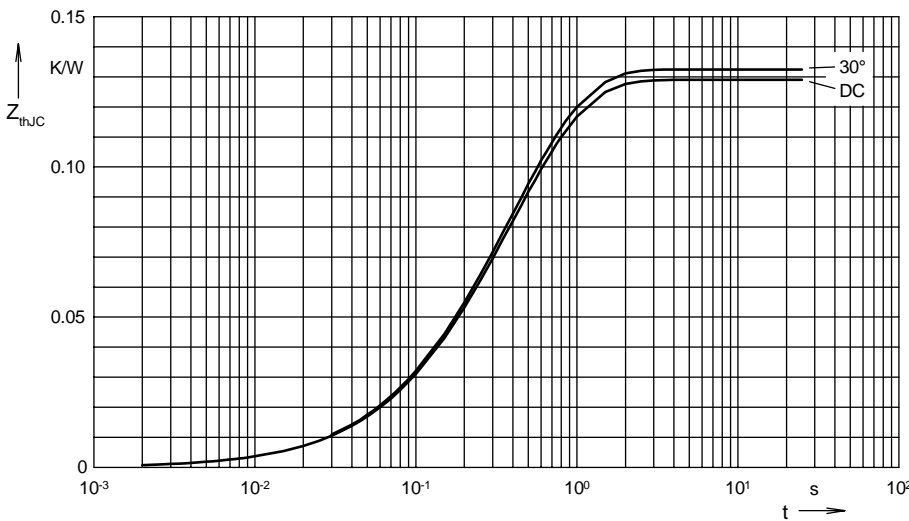


Fig. 6 Transient thermal impedance junction to case (per diode)

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

$d$	$R_{thJC}$ (K/W)
DC	0.129
180°	0.131
120°	0.132
60°	0.132
30°	0.133

Constants for  $Z_{thJC}$  calculation:

$i$	$R_{thi}$ (K/W)	$t_i$ (s)
1	0.0035	0.0099
2	0.0165	0.168
3	0.1091	0.456

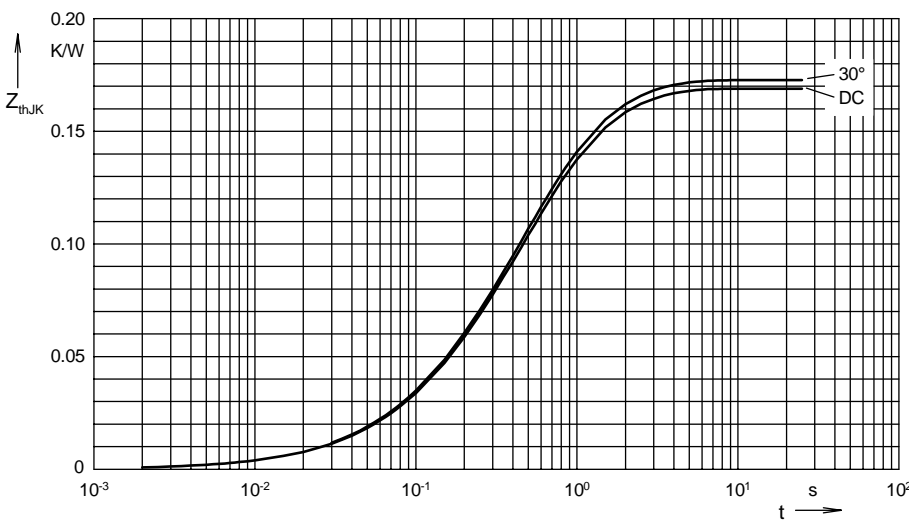


Fig. 7 Transient thermal impedance junction to heatsink (per diode)

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

$d$	$R_{thJK}$ (K/W)
DC	0.169
180°	0.171
120°	0.172
60°	0.172
30°	0.173

Constants for  $Z_{thJK}$  calculation:

$i$	$R_{thi}$ (K/W)	$t_i$ (s)
1	0.0035	0.0099
2	0.0165	0.168
3	0.1091	0.456
4	0.04	1.36