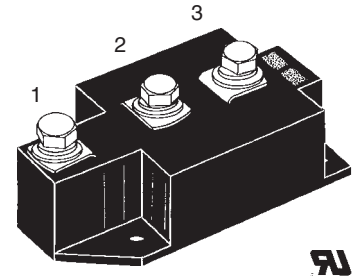
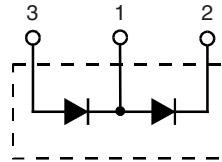


# High Power Diode Modules

$I_{FRMS} = 2 \times 450 \text{ A}$   
 $I_{FAVM} = 2 \times 270 \text{ A}$   
 $V_{RRM} = 800-1800 \text{ V}$

$V_{RSM}$ V	$V_{RRM}$ V	Type
900	800	MDD 220-08N1
1300	1200	MDD 220-12N1
1500	1400	MDD 220-14N1
1700	1600	MDD 220-16N1
1900	1800	MDD 220-18N1



Symbol	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
$I_{FSM}$	$T_{VJ} = 45^\circ\text{C}; V_R = 0$	t = 10 ms (50 Hz), sine	8500 A
		t = 8.3 ms (60 Hz), sine	9000 A
	$T_{VJ} = T_{VJM}; V_R = 0$	t = 10 ms (50 Hz), sine	7500 A
		t = 8.3 ms (60 Hz), sine	8000 A
$\int i^2 dt$	$T_{VJ} = 45^\circ\text{C}; V_R = 0$	t = 10 ms (50 Hz), sine	360 000 A <sup>2</sup> s
		t = 8.3 ms (60 Hz), sine	340 000 A <sup>2</sup> s
	$T_{VJ} = T_{VJM}; V_R = 0$	t = 10 ms (50 Hz), sine	280 000 A <sup>2</sup> s
		t = 8.3 ms (60 Hz), sine	260 000 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 $I_{ISOL} \leq 1 \text{ mA}$	t = 1 min	3000 V~
		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  $\text{Al}_2\text{O}_3$  -ceramic base plate
- Planar passivated chips
- Isolation voltage 3600 V~
- UL registered, E 72873

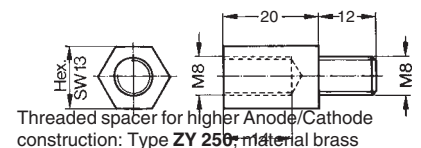
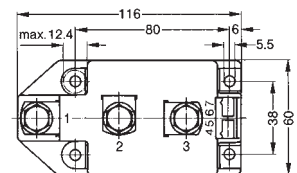
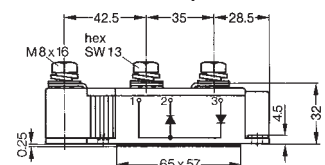
## Applications

- 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		
$I_{RRM}$	$T_{VJ} = T_{VJM}; V_R = V_{RRM}$	40	mA	
$V_F$	$I_F = 600 \text{ A}; T_{VJ} = 25^\circ\text{C}$	1.4	V	
$V_{T0}$	For power-loss calculations only	0.75	V	
$r_T$	$T_{VJ} = T_{VJM}$	0.9	mΩ	
$R_{thJC}$	per diode; DC current per module	} other values see Fig. 6/7	0.129	K/W
			0.065	K/W
$R_{thJK}$	per diode; DC current per module	}	0.169	K/W
			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>	

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

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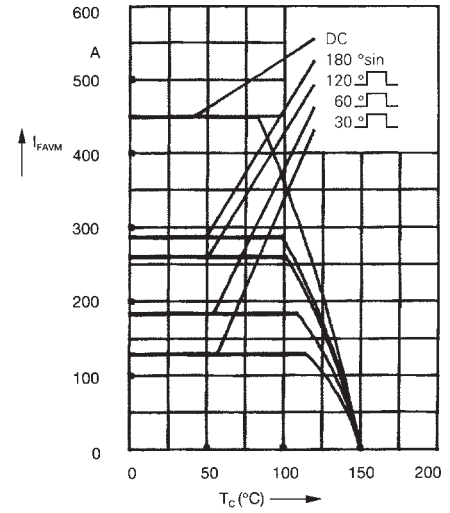
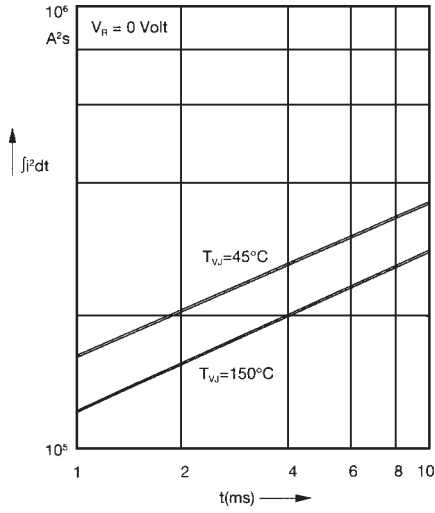
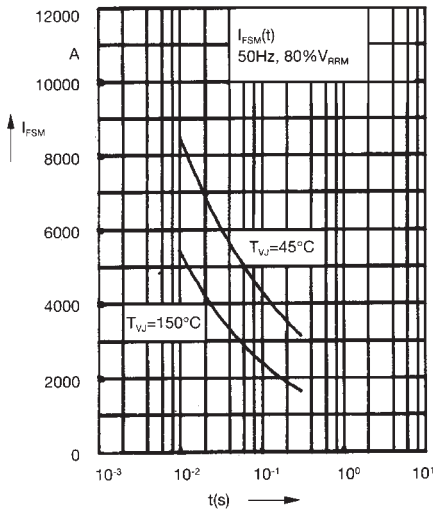


Fig. 1 Surge overload current  
 $I_{FSM}$ : Crest value,  $t$ : duration

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

Fig. 2a Maximum forward current at case temperature

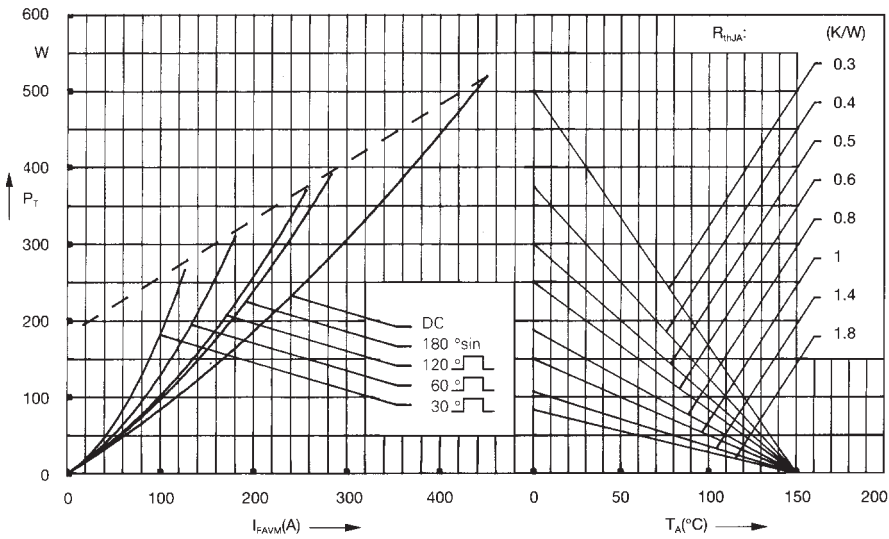


Fig. 3 Power dissipation versus forward current and ambient temperature (per diode)

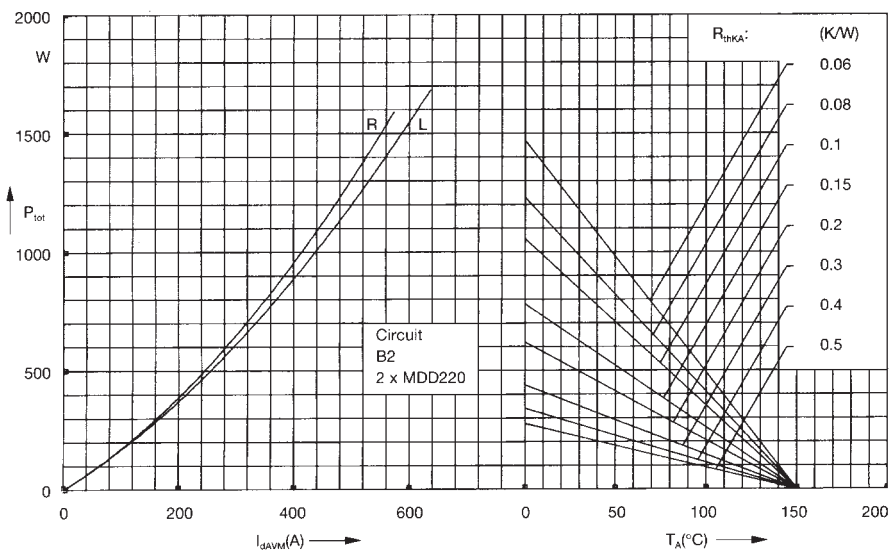


Fig. 4 Single phase rectifier bridge:  
Power dissipation versus direct output current and ambient temperature  
R = resistive load  
L = inductive load

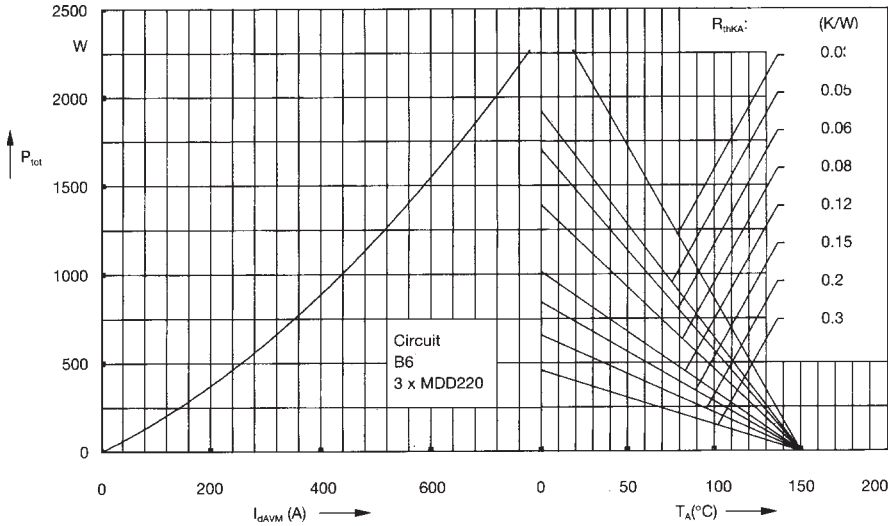


Fig. 5 Three phase rectifier bridge: Power dissipation versus direct output current and ambient temperature

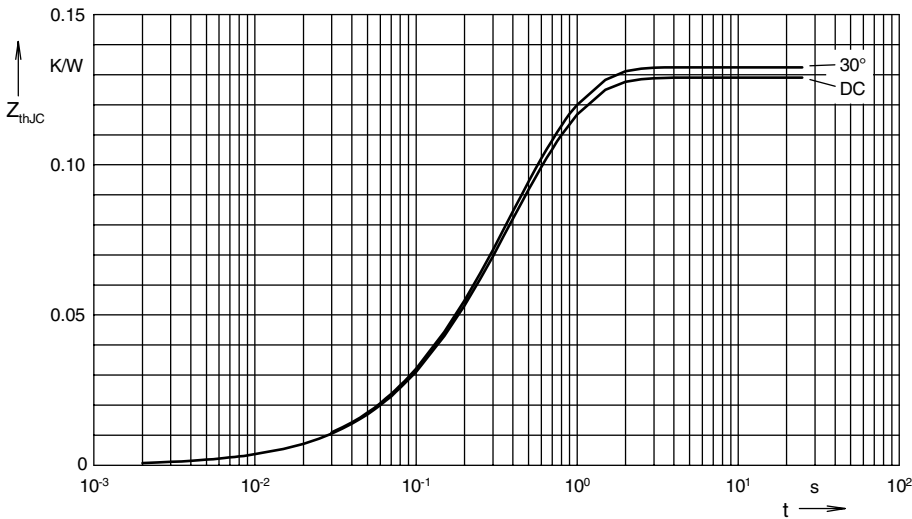


Fig. 6 Transient thermal impedance junction to case (per diode)

$R_{thJC}$  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

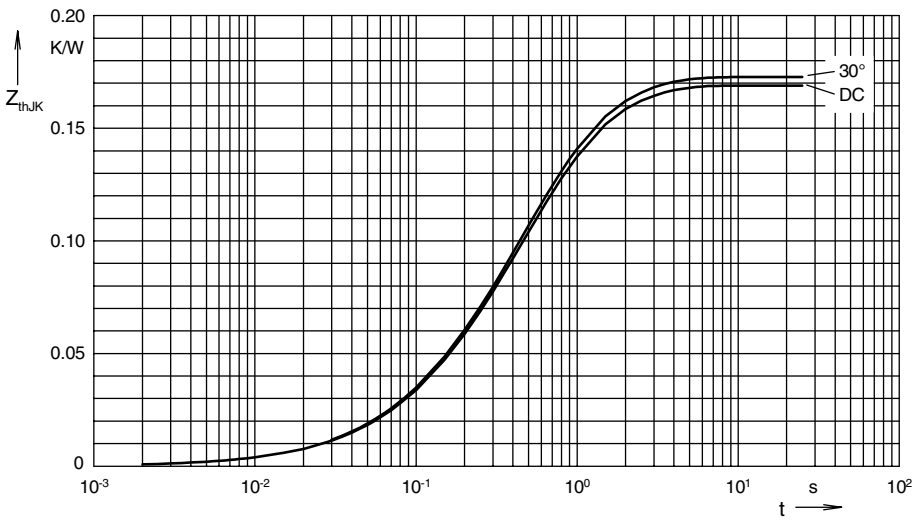


Fig. 7 Transient thermal impedance junction to heatsink (per diode)

$R_{thJK}$  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