

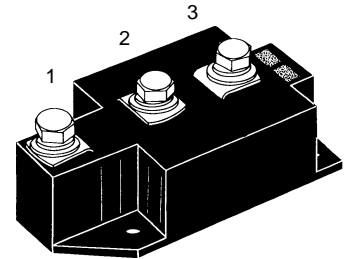
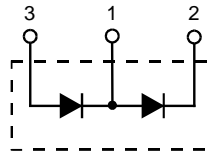
High Power Diode Modules

$$I_{FRMS} = 2 \times 480 \text{ A}$$

$$I_{FAVM} = 2 \times 305 \text{ A}$$

$$V_{RRM} = 800\text{-}2200 \text{ V}$$

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 ² s
		t = 8.3 ms (60 Hz), sine	620 000 A ² s
	$T_{VJ} = T_{VJM}; V_R = 0$	t = 10 ms (50 Hz), sine	460 000 A ² s
		t = 8.3 ms (60 Hz), sine	430 000 A ² s
T_{VJ}		-40...+150	°C
T_{VJM}		150	°C
T_{sig}		-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_2O_3 -ceramic base plate
- Planar passivated chips
- Isolation voltage 3600 V~
- UL registered, E 72873

Applications

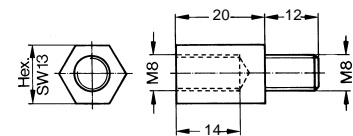
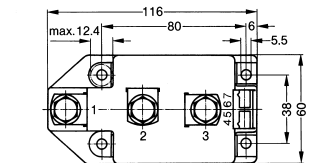
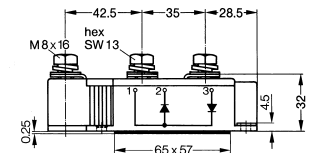
- Supplies for DC power equipment
- DC supply for PWM inverter
- Field supply for DC motors
- Battery DC power supplies

Advantages

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

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 per module	other values see Fig. 6/7	0.129	K/W
			0.065	K/W
R_{thJK}	per diode; DC current per module	see Fig. 6/7	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 ²	

Dimensions in mm (1 mm = 0.0394")



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

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

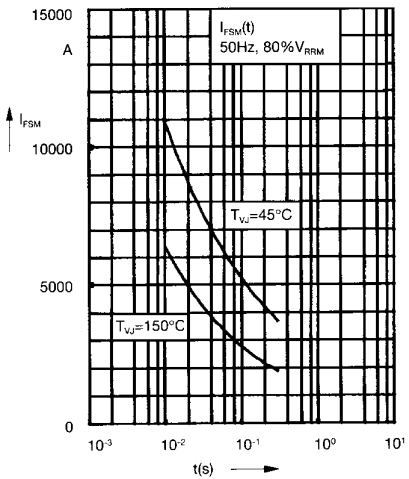


Fig. 1 Surge overload current
 I_{FSM} : Crest value, t: duration

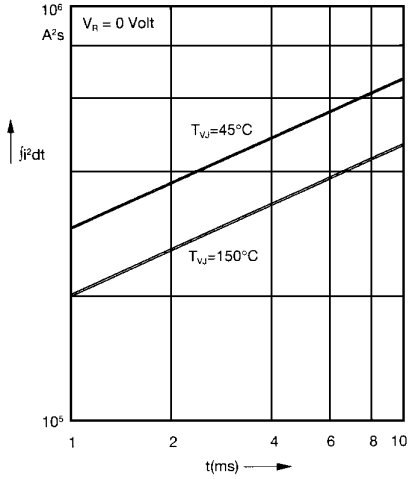


Fig. 2 j^2dt versus time (1-10 ms)

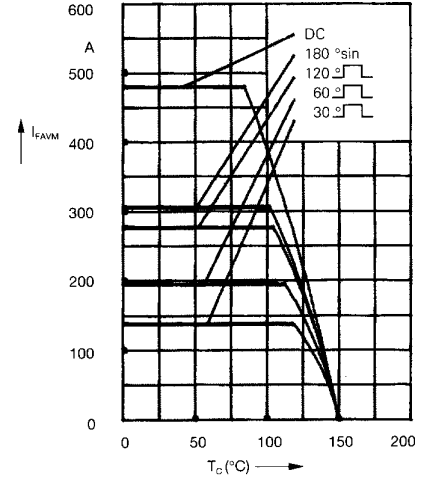


Fig. 2a Maximum forward current at case temperature

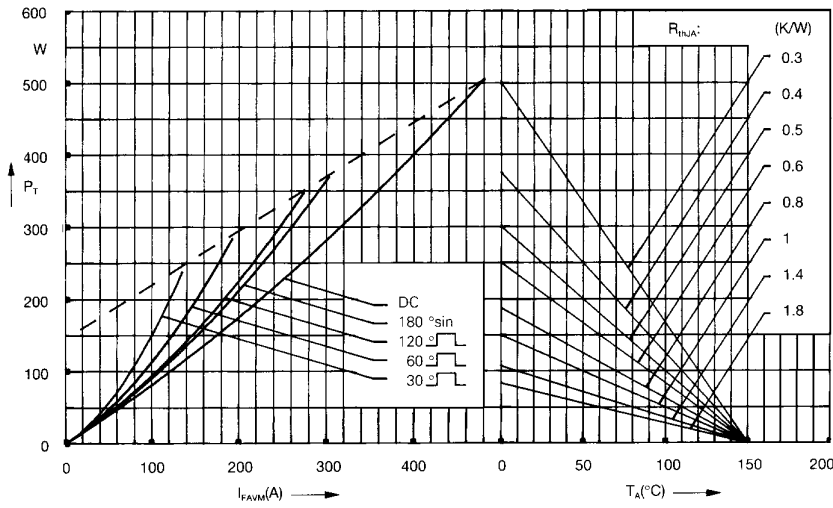


Fig. 3 Power dissipation versus forward current and ambient temperature (per diode)

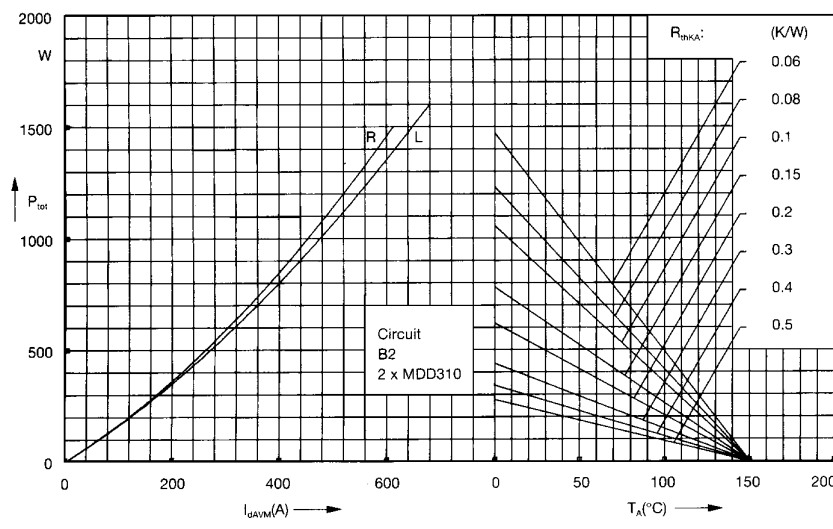


Fig. 4 Single phase rectifier bridge:
 Power dissipation versus direct output current and ambient temperature
 R = resistive load
 L = inductive load

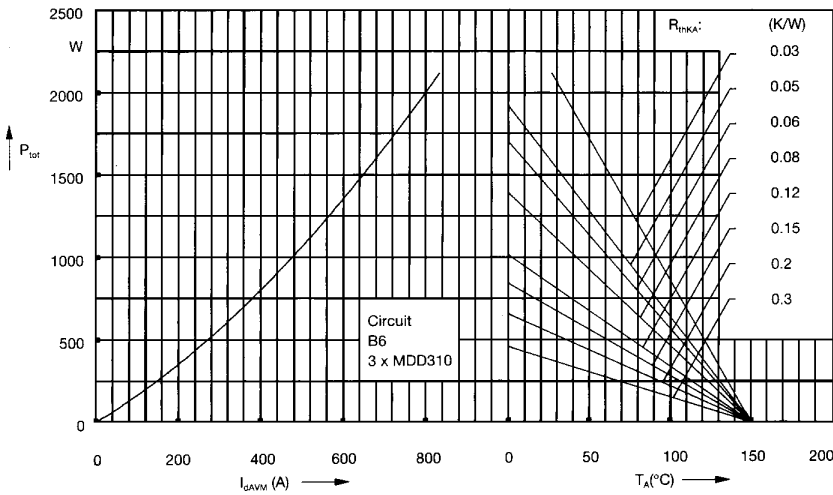


Fig. 5 Three phase rectifier bridge: Power dissipation versus direct output current and ambient temperature

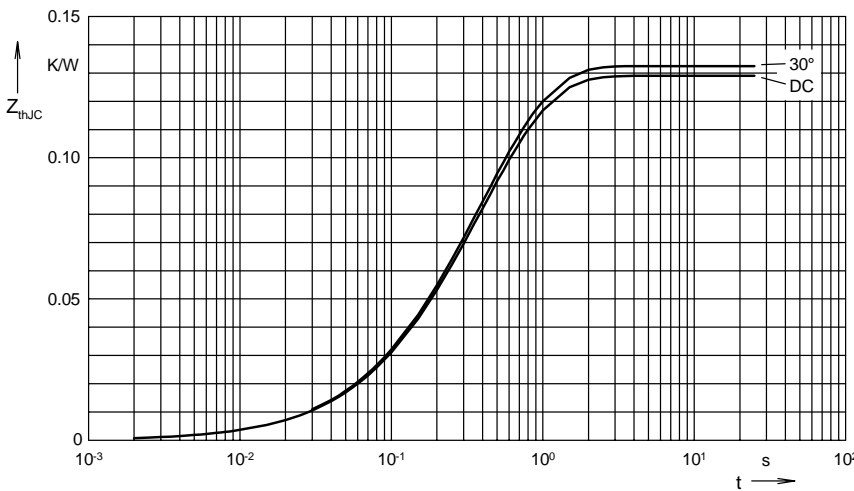


Fig. 6 Transient thermal impedance junction to case (per diode)

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

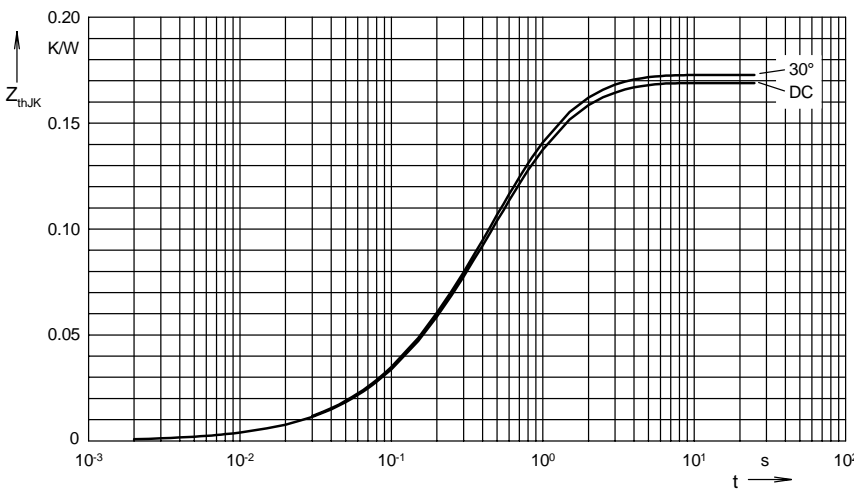


Fig. 7 Transient thermal impedance junction to heatsink (per diode)

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