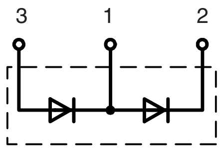
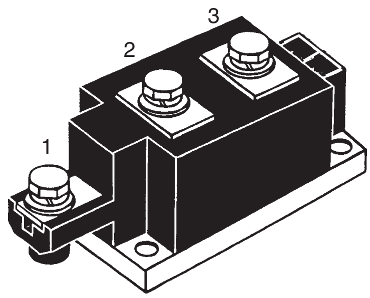
High Power Diode Modules

I_{FRMS} = 2x520 A
I_{FAVM} = 2x310 A
V_{RRM} = 1200-2200 V

V_{RSM} / V_{DSM} V	V_{RRM} / V_{DRM} 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





Symbol	Conditions		Maximum Ratings	
I_{FRMS}	$T_{VJ} = T_{VJM}$		520	A
I_{FAVM}	T_C = 100°C; 180° sine		310	A
I_{FSM}	T_{VJ} = 45°C;	t = 10 ms (50 Hz)	10500	A
	V_R = 0	t = 8.3 ms (60 Hz)	11200	A
	$T_{VJ} = T_{VJM}$	t = 10 ms (50 Hz)	9200	A
	V_R = 0	t = 8.3 ms (60 Hz)	9800	A
$\int i^2dt$	T_{VJ} = 45°C	t = 10 ms (50 Hz)	551000	A^2s
	V_R = 0	t = 8.3 ms (60 Hz)	527000	A^2s
	$T_{VJ} = T_{VJM}$	t = 10 ms (50 Hz)	423 000	A^2s
	V_R = 0	t = 8.3 ms (60 Hz)	403 000	A^2s
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~
	$I_{ISOL} \leq 1$ mA	t = 1 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

Symbol	Conditions	Characteristic Values	
I_{RRM}	$T_{VJ} = T_{VJM}$; $V_R = V_{RRM}$	30	mA
V_F	I_F = 600 A; T_{VJ} = 25°C	1.32	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	0.12	K/W
	per module	0.06	K/W
R_{thJK}	per diode; DC current	0.16	K/W
	per module	0.08	K/W
Q_S	T_{VJ} = 125°C; I_F = 400 A; -di/dt = 50 A/μs	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.

Features

- International standard package
- Direct copper bonded Al_2O_3-ceramic with copper base plate
- Planar passivated chips
- Isolation voltage 3600 V~
- UL registered E 72873

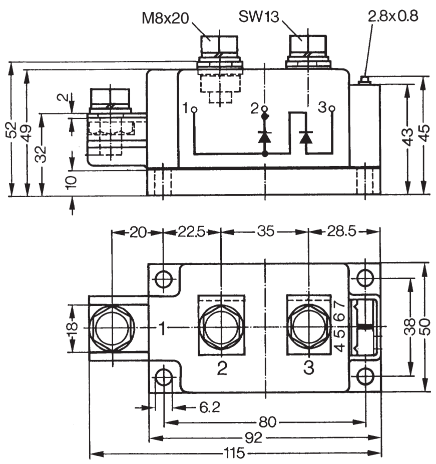
Applications

- 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")



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

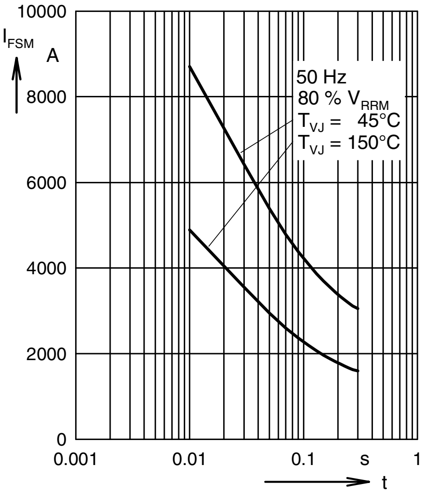

Fig. 1 Surge overload current
I_{FSM}: Crest value, t: duration

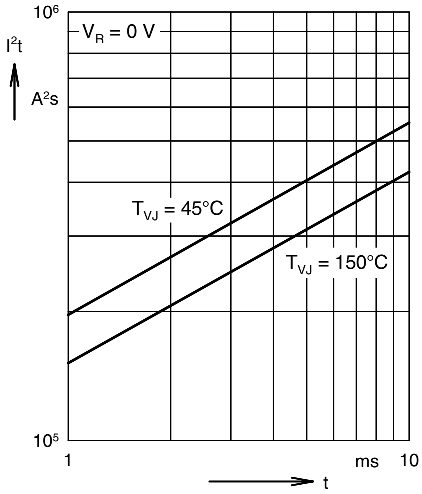

Fig. 2 I^2t versus time (1-10 ms)

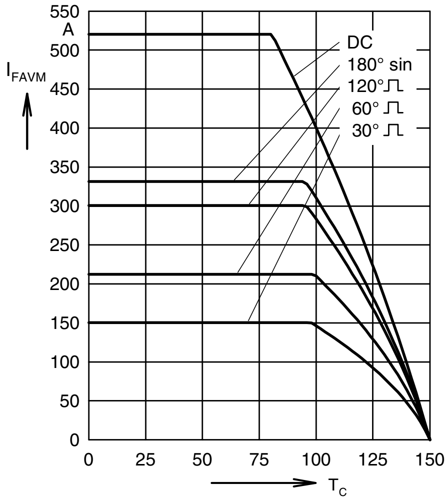

Fig. 3 Maximum forward current at case temperature

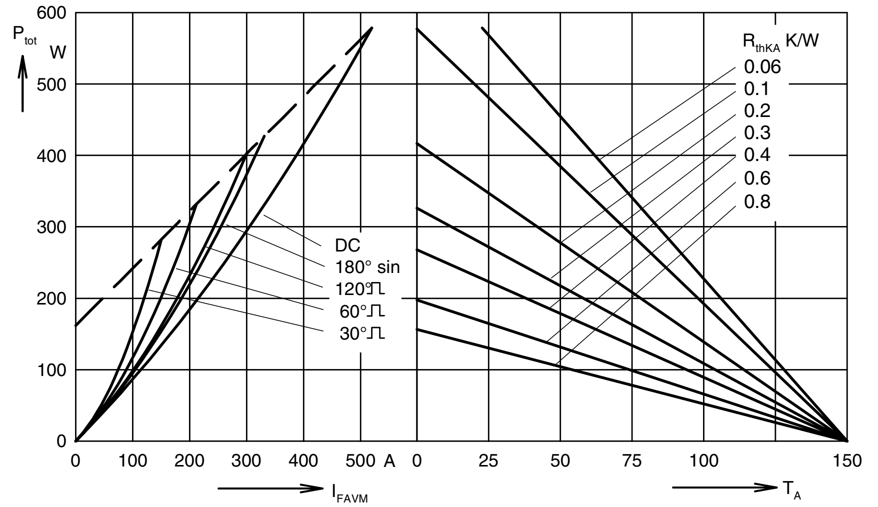

Fig. 4 Power dissipation vs. forward current and ambient temperature (per diode)

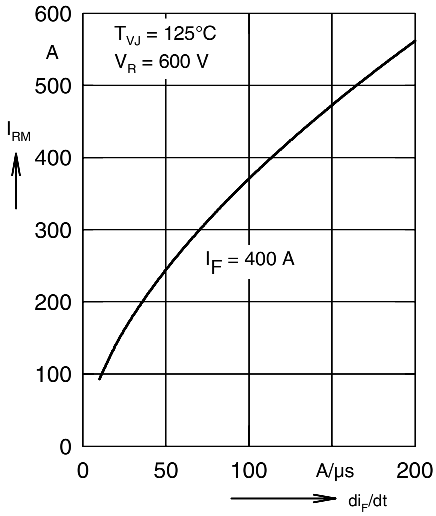

Fig. 5 Typ. peak reverse current I_{RM} versus $-di_F/dt$

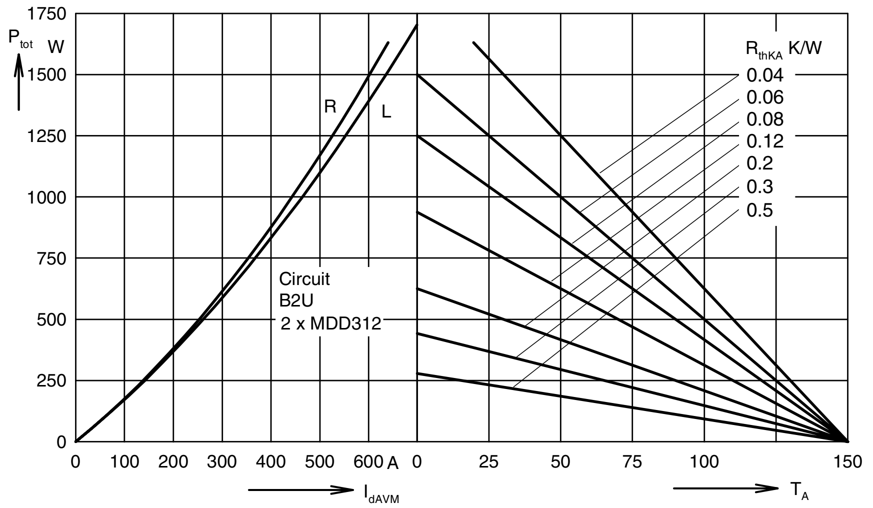

Fig. 6 Single phase rectifier bridge: Power dissipation vs. direct output current and ambient temperature R = resistive load, L = inductive load

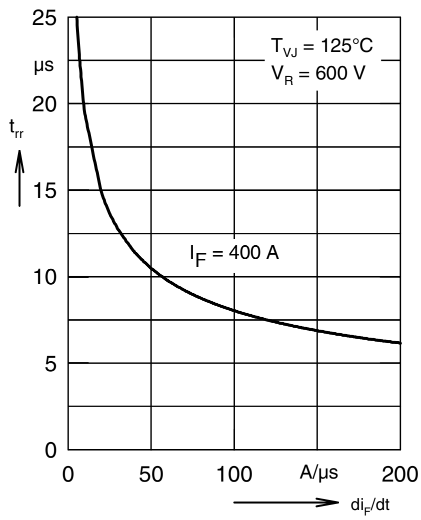

Fig. 7 Typ. recovery time t_{rr} versus $-di_F/dt$

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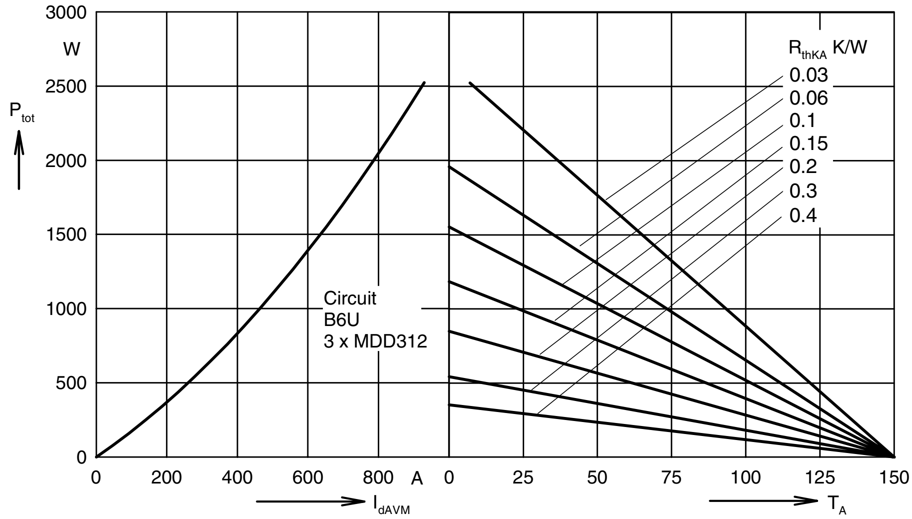

Fig. 8 Three phase rectifier bridge: Power dissipation versus direct output current and ambient temperature

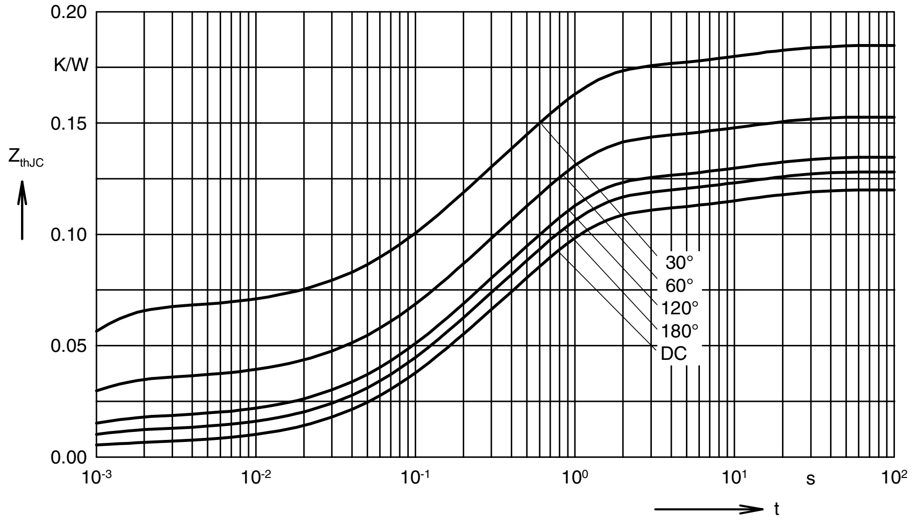

Fig. 9 Transient thermal impedance junction to case (per diode)

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

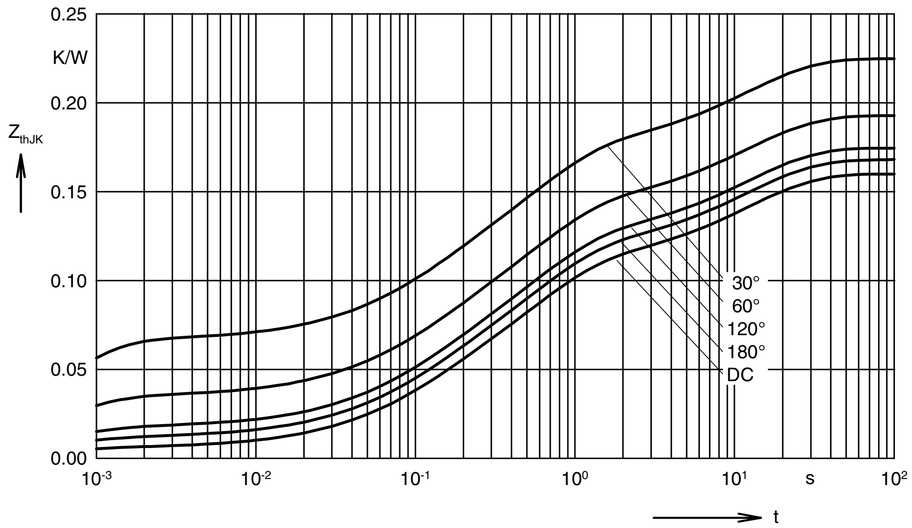

Fig. 10 Transient thermal impedance junction to heatsink (per diode)

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

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