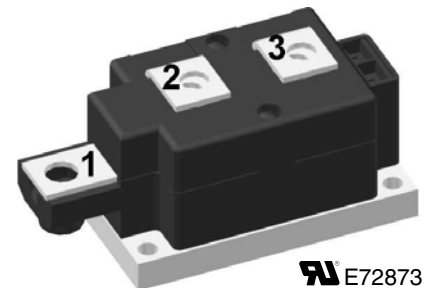
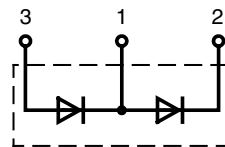


High Power Diode Modules

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

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



Symbol	Conditions	Maximum Ratings
I_{FRMS}	$T_{VJ} = T_{VJM}$	$T_C = 25^\circ\text{C}$ 520 A
I_{FAVM}	180° sine	$T_C = 100^\circ\text{C}$ 310 A
I_{FSM}	$T_{VJ} = 45^\circ\text{C}; t = 10 \text{ ms}$	(50 Hz) 10500 A
	$V_R = 0; t = 8.3 \text{ ms}$	(60 Hz) 11200 A
	$T_{VJ} = T_{VJM}; t = 10 \text{ ms}$	(50 Hz) 9200 A
	$V_R = 0; t = 8.3 \text{ ms}$	(60 Hz) 9800 A
I^2t	$T_{VJ} = 45^\circ\text{C}; t = 10 \text{ ms}$	(50 Hz) 551 000 A ² s
	$V_R = 0; t = 8.3 \text{ ms}$	(60 Hz) 527 000 A ² s
	$T_{VJ} = T_{VJM}; t = 10 \text{ ms}$	(50 Hz) 423 000 A ² s
	$V_R = 0; t = 8.3 \text{ ms}$	(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 $t = 1 \text{ min}$	3000 V~
	$I_{ISOL} \leq 1 \text{ mA}$ $t = 1 \text{ s}$	3600 V~
M_d	Mounting torque (M6)	4.5 - 7 Nm
	Terminal connection torque (M8)	11-13 Nm
Weight	Typical including screws	750 g

Features

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

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 & power cycling
- Reduced protection circuits

Symbol	Conditions	Characteristics Values
I_{RRM}	$V_R = V_{RRM}$	$T_{VJ} = T_{VJM}$ 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	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	$I_F = 400 \text{ A}; -di/dt = 50 \text{ A}/\mu\text{s}; T_{VJ} = 125^\circ\text{C}$	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.

The technical drawing consists of two views of a mechanical component:

- Front View (Top):** Shows the main body with three mounting points labeled M8 x 16, SW 13, and 2.8 x 0.8. Dimensions include overall height 52 (+0/-1.4), mounting hole center-to-center distance 49, and base thickness 10.
- Top View (Bottom):** Shows the plan view with dimensions 115 (total width), 92 (main body width), and 80 (distance between mounting holes). Mounting holes are numbered 1, 2, and 3. Other dimensions include 20, 22.5, 35, 28.5, 18, 6.2, 45, 67, 38, and 50.

2 - 4

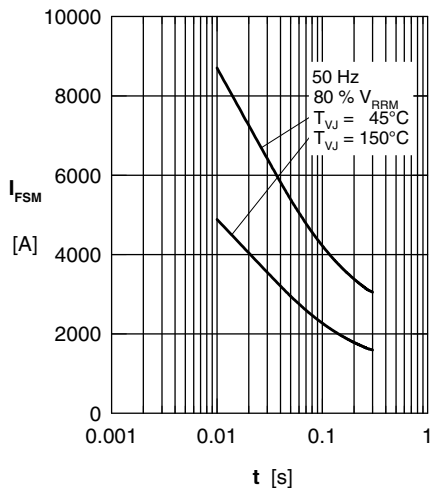


Fig. 1 Surge overload current I_{FSM} : Crest value, t : duration

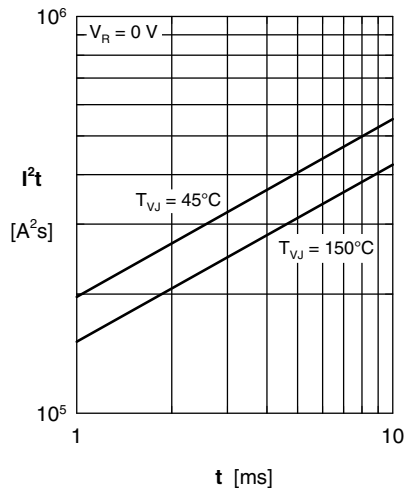


Fig. 2 I^2t versus time (1-10 ms)

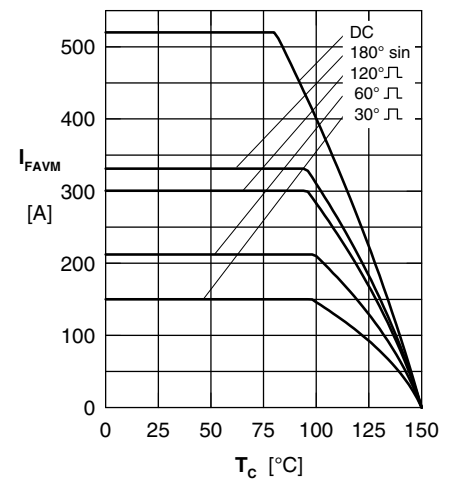


Fig. 3 Maximum forward current at case temperature

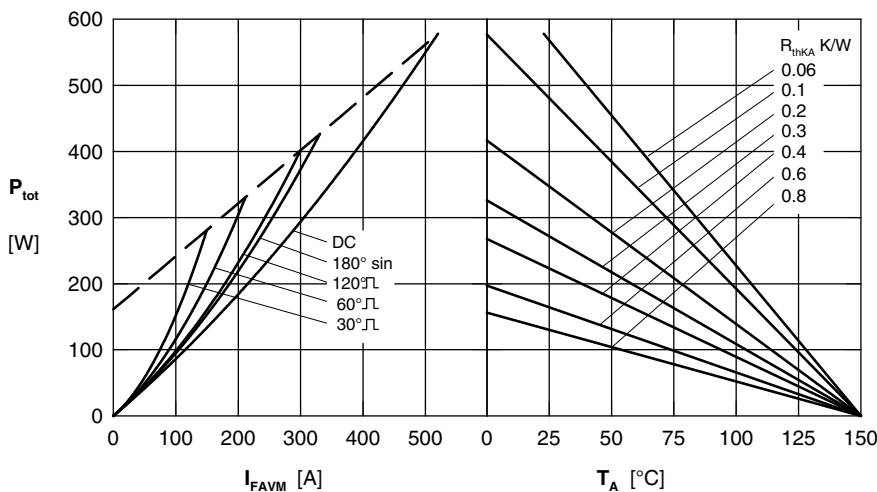


Fig. 4 Power dissipation vs. forward current & ambient temperature (per diode)

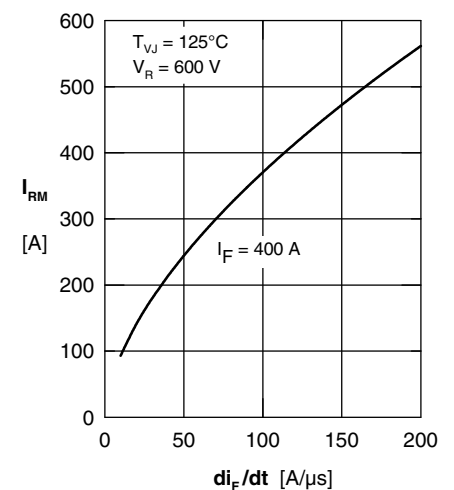


Fig. 5 Typ. peak reverse current

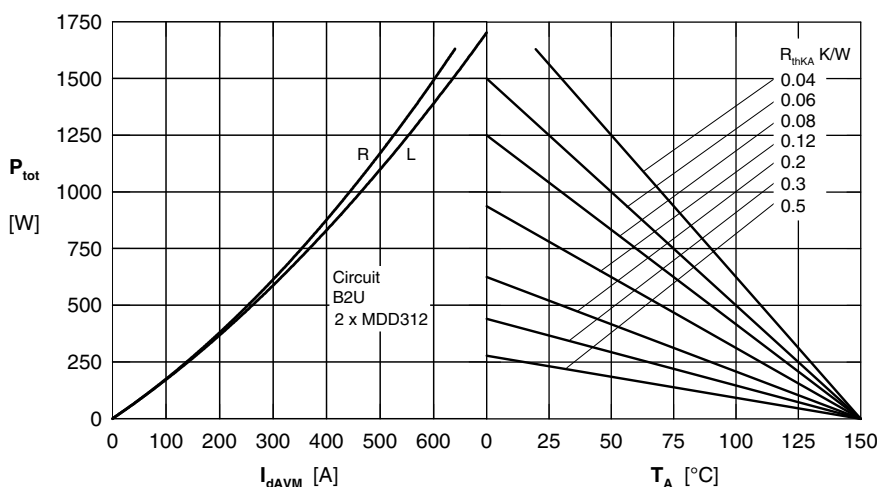


Fig. 6 Single phase rectifier bridge: Power dissipation vs. direct output current and ambient temperature R = resistive load, L = inductive load

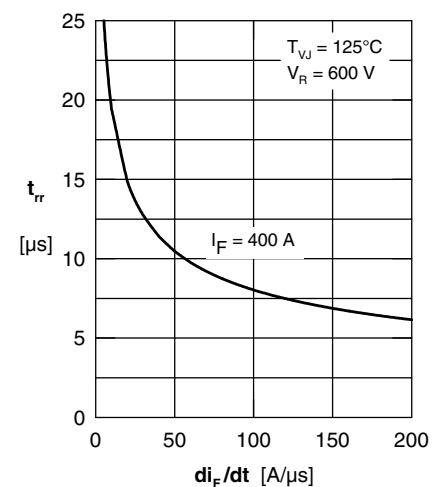


Fig. 7 Typ. recovery time t_{rr} versus $-di_F/dt$

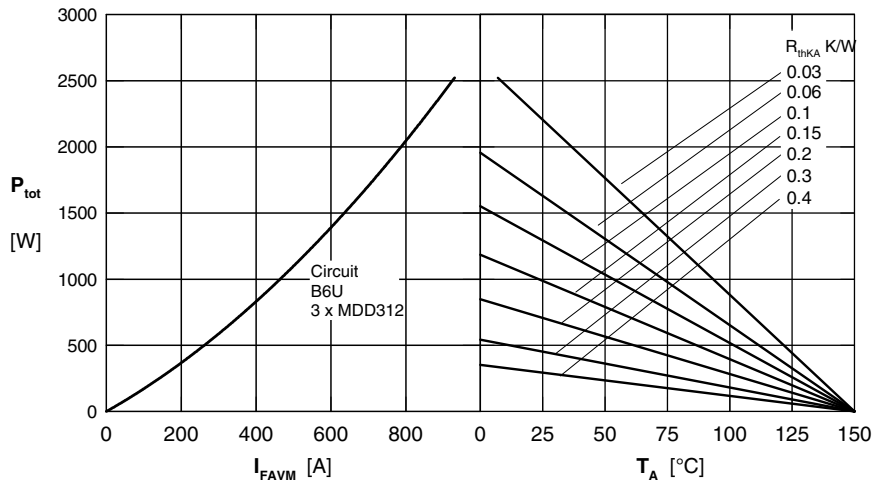


Fig. 8 Three phase rectifier bridge: Power dissipation vs. direct output current & ambient temperature

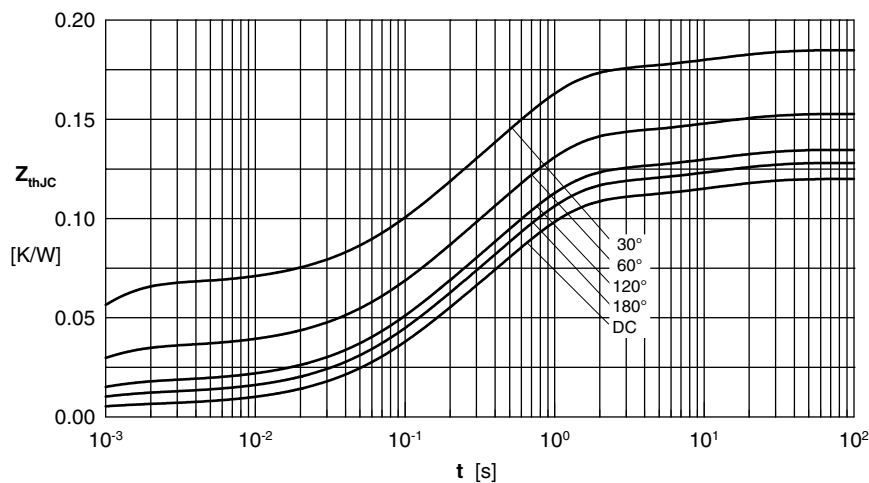


Fig. 9 Transient thermal impedance junction to case (per diode)

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

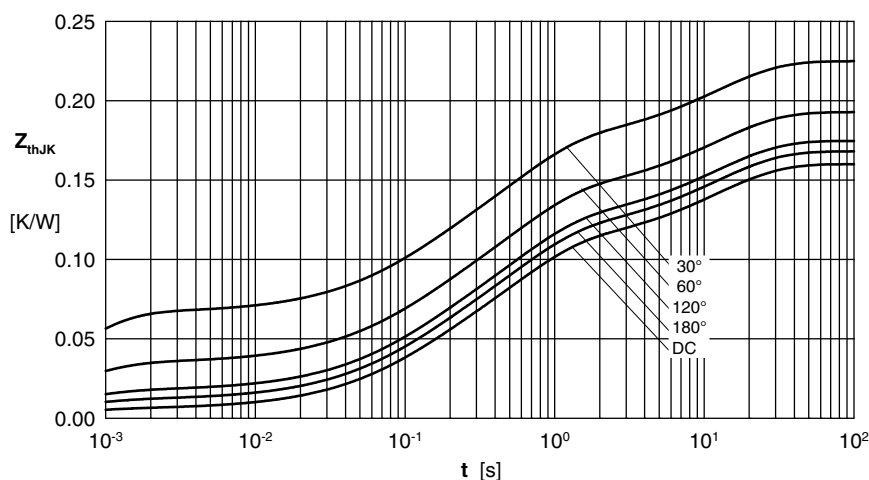


Fig. 10 Transient thermal impedance junction to heatsink (per diode)

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