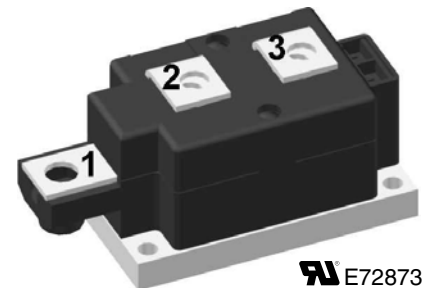
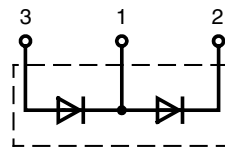


High Power Diode Modules

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

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



E72873

Symbol	Conditions	Maximum Ratings
I_{FRMS}	$T_{\text{VJ}} = T_{\text{VJM}}$	$T_{\text{C}} = 25^{\circ}\text{C}$ 520 A
I_{FAVM}	180° sine	$T_{\text{C}} = 100^{\circ}\text{C}$ 310 A
I_{FSM}	$T_{\text{VJ}} = 45^{\circ}\text{C};$	$t = 10 \text{ ms}$ (50 Hz) 10500 A
	$V_{\text{R}} = 0$	$t = 8.3 \text{ ms}$ (60 Hz) 11200 A
	$T_{\text{VJ}} = T_{\text{VJM}};$	$t = 10 \text{ ms}$ (50 Hz) 9200 A
	$V_{\text{R}} = 0$	$t = 8.3 \text{ ms}$ (60 Hz) 9800 A
I^2t	$T_{\text{VJ}} = 45^{\circ}\text{C};$	$t = 10 \text{ ms}$ (50 Hz) 551 000 A ² s
	$V_{\text{R}} = 0$	$t = 8.3 \text{ ms}$ (60 Hz) 527 000 A ² s
	$T_{\text{VJ}} = T_{\text{VJM}};$	$t = 10 \text{ ms}$ (50 Hz) 423 000 A ² s
	$V_{\text{R}} = 0$	$t = 8.3 \text{ ms}$ (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~
	$I_{\text{ISOL}} \leq 1 \text{ mA}$ $t = 1 \text{ s}$	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

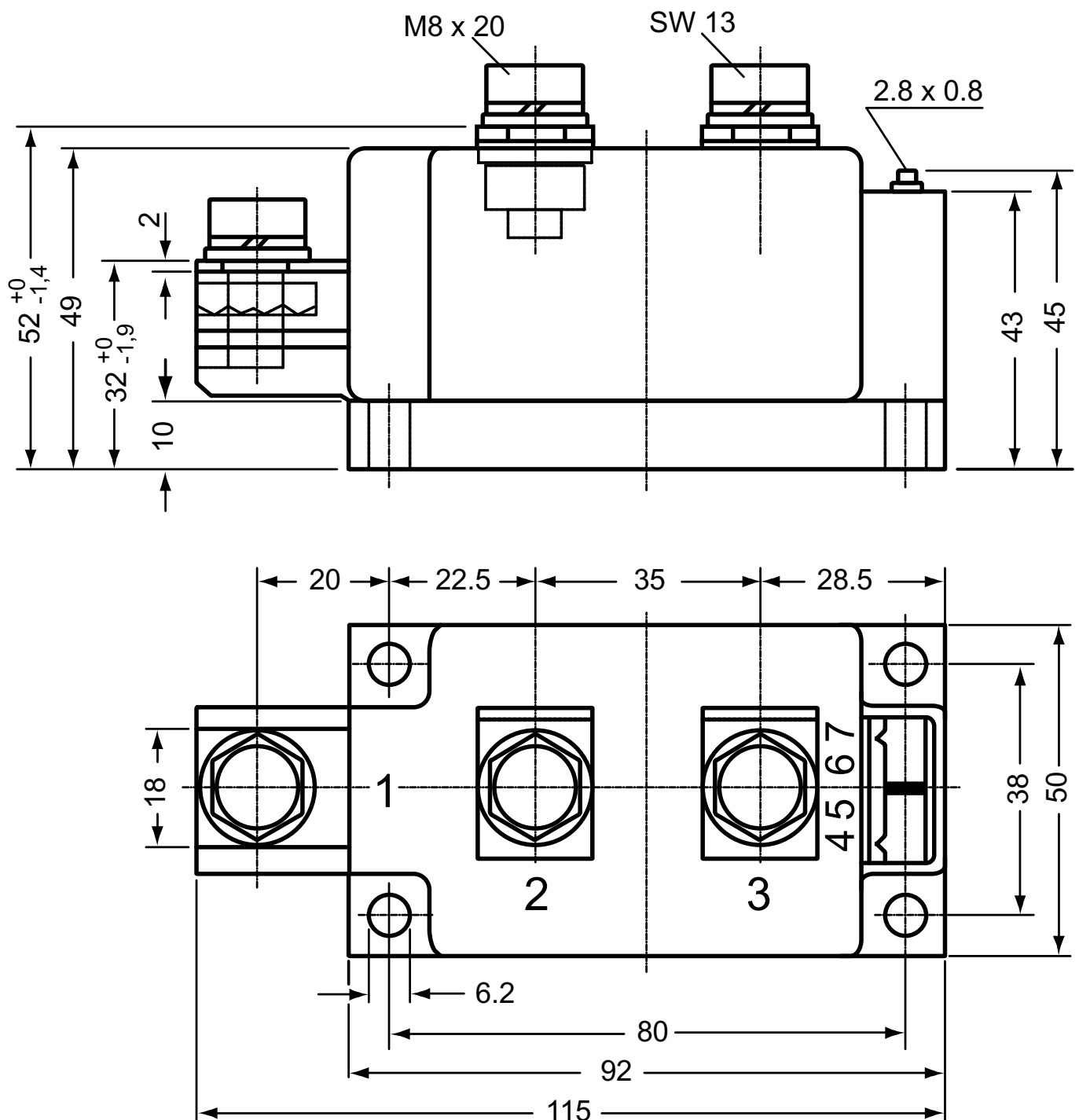
Advantages

- Simple mounting
- Improved temperature & power cycling
- Reduced protection circuits

Symbol	Conditions	Characteristics Values
I_{RRM}	$V_{\text{R}} = V_{\text{RRM}}$	$T_{\text{VJ}} = T_{\text{VJM}}$ 30 mA
V_{F}	$I_{\text{F}} = 600 \text{ A};$	$T_{\text{VJ}} = 25^{\circ}\text{C}$ 1.32 V
V_{T0}	For power-loss calculations only	0.8 V
r_{t}	$T_{\text{VJ}} = T_{\text{VJM}}$	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}	$I_{\text{F}} = 400 \text{ A}; -di/dt = 50 \text{ A}/\mu\text{s}; T_{\text{VJ}} = 125^{\circ}\text{C}$	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.

Dimensions in mm (1 mm = 0.0394")



Optional accessories for modules

Keyed gate/cathode twin plugs with wire length = 350 mm, gate = white, cathode = red

Type ZY 180L (L = Left for pin pair 4/5)

Type ZY 180R (R = Right for pin pair 6/7) } UL 758, style 3751

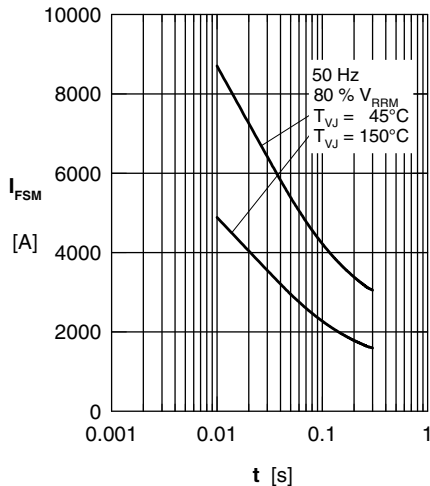


Fig. 1 Surge overload current I_{FSM} : Crest value, t : duration

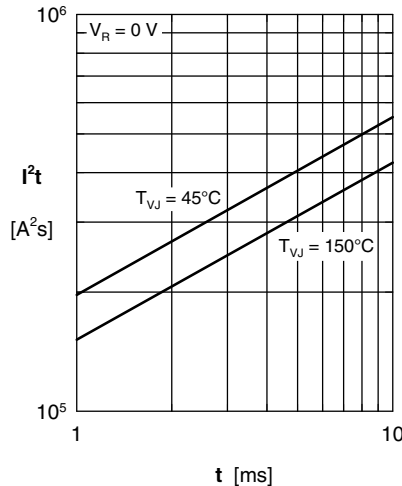


Fig. 2 I^2t versus time (1-10 ms)

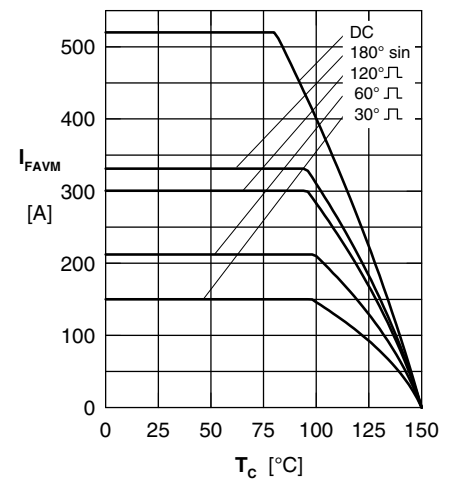


Fig. 3 Maximum forward current at case temperature

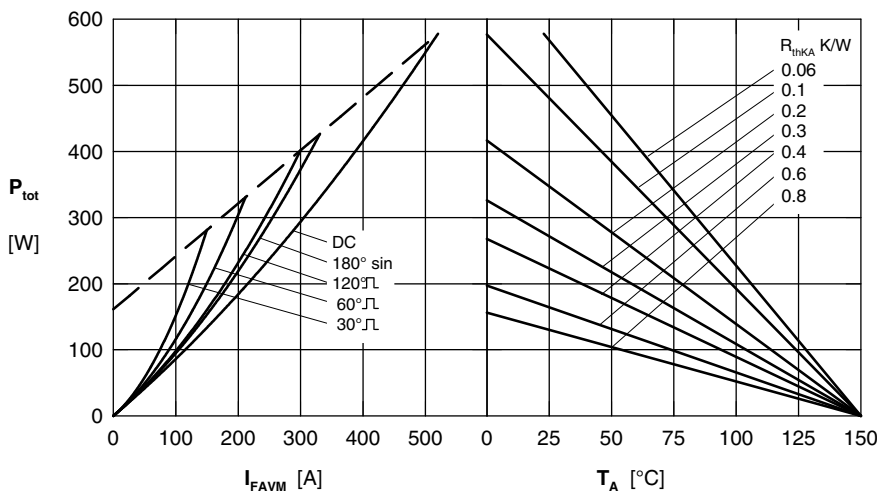


Fig. 4 Power dissipation vs. forward current & ambient temperature (per diode)

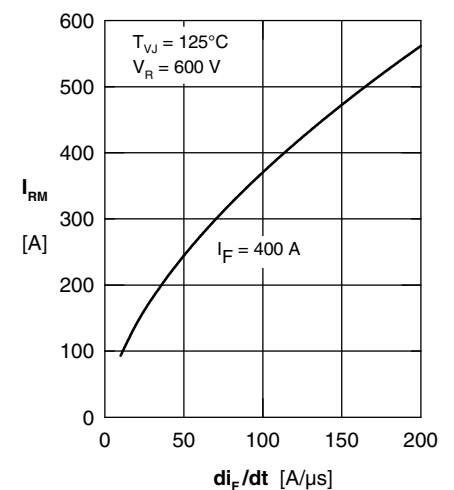


Fig. 5 Typ. peak reverse current

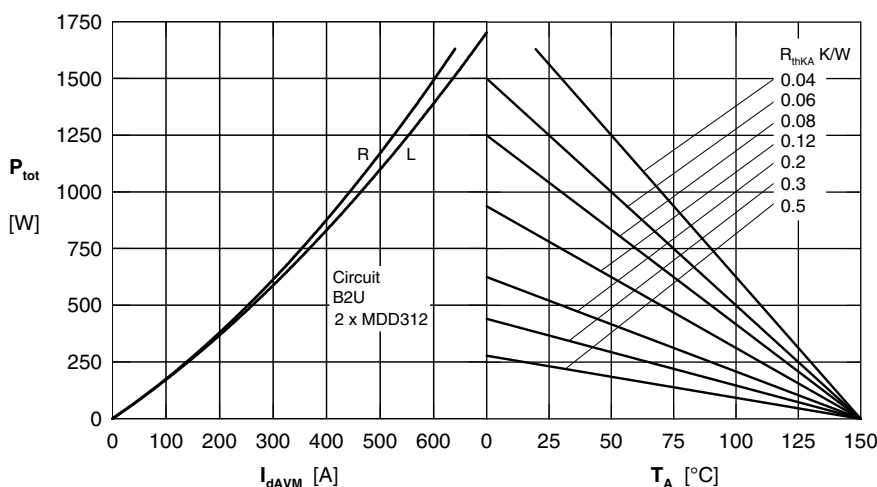


Fig. 6 Single phase rectifier bridge: Power dissipation vs. direct output current and ambient temperature R = resistive load, L = inductive load

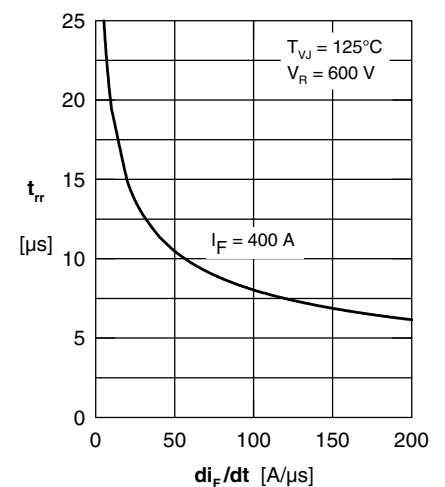


Fig. 7 Typ. recovery time t_{rr} versus $-di_F/dt$

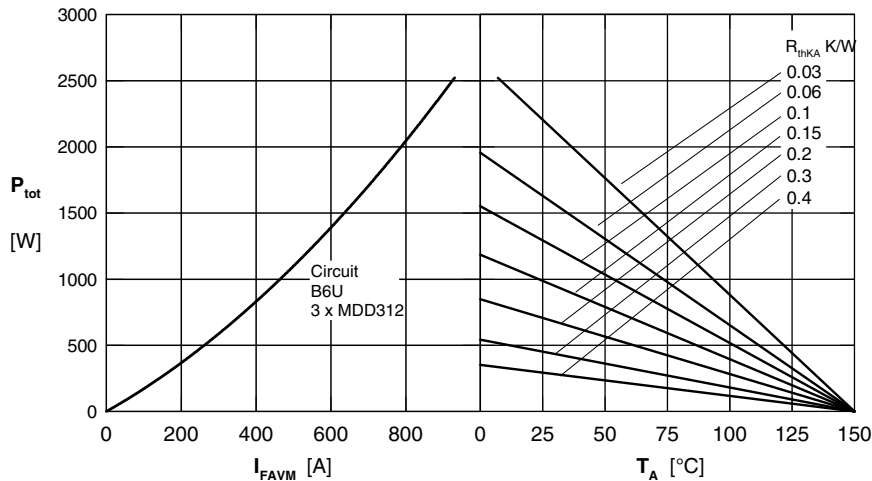


Fig. 8 Three phase rectifier bridge: Power dissipation vs. direct output current & ambient temperature

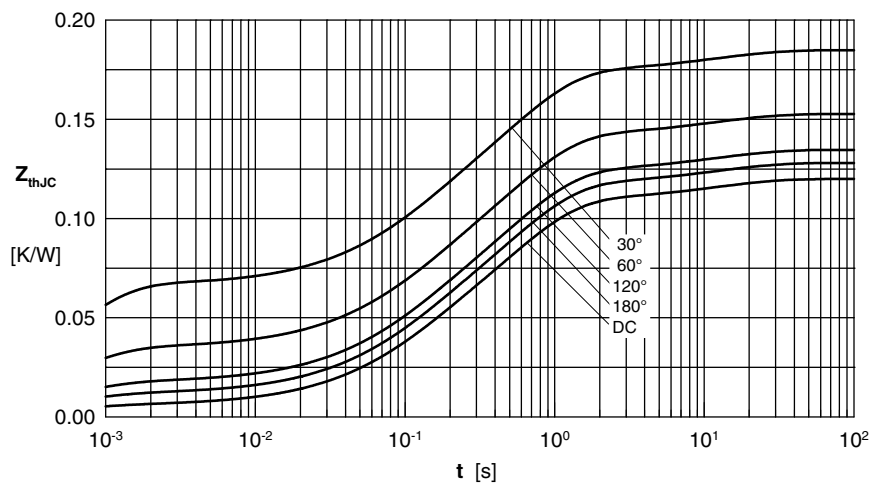


Fig. 9 Transient thermal impedance junction to case (per diode)

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

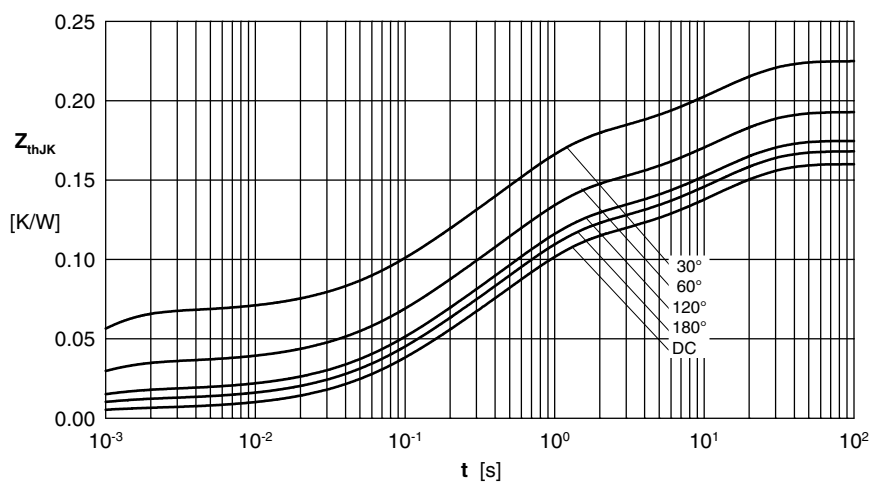


Fig. 10 Transient thermal impedance junction to heatsink (per diode)

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