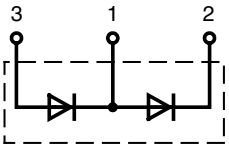
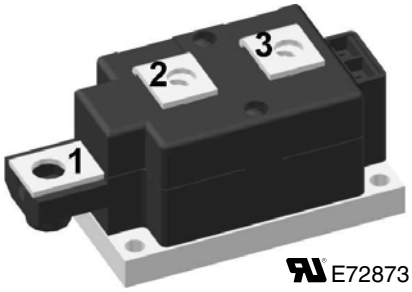
High Power Diode Modules

I_{FRMS} = 2x 520 A
I_{FAVM} = 2x 310 A
V_{RRM} = 1200-2200 V

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°C	520	A
I_{FAVM}	180° sine		T_C = 100°C	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
I^2t	T_{VJ} = 45°C;	t = 10 ms	(50 Hz)	551 000	A^2s
	V_R = 0	t = 8.3 ms	(60 Hz)	527 000	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	Nm
	Terminal connection torque (M8)			11-13	Nm
Weight	Typical including screws			750	g

Symbol	Conditions		Characteristics Values	
I_{RRM}	$V_R = V_{RRM}$	$T_{VJ} = T_{VJM}$	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	other values see MCC 255	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 A; -di/dt = 50 A/µs; T_{VJ} = 125°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.

Features

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

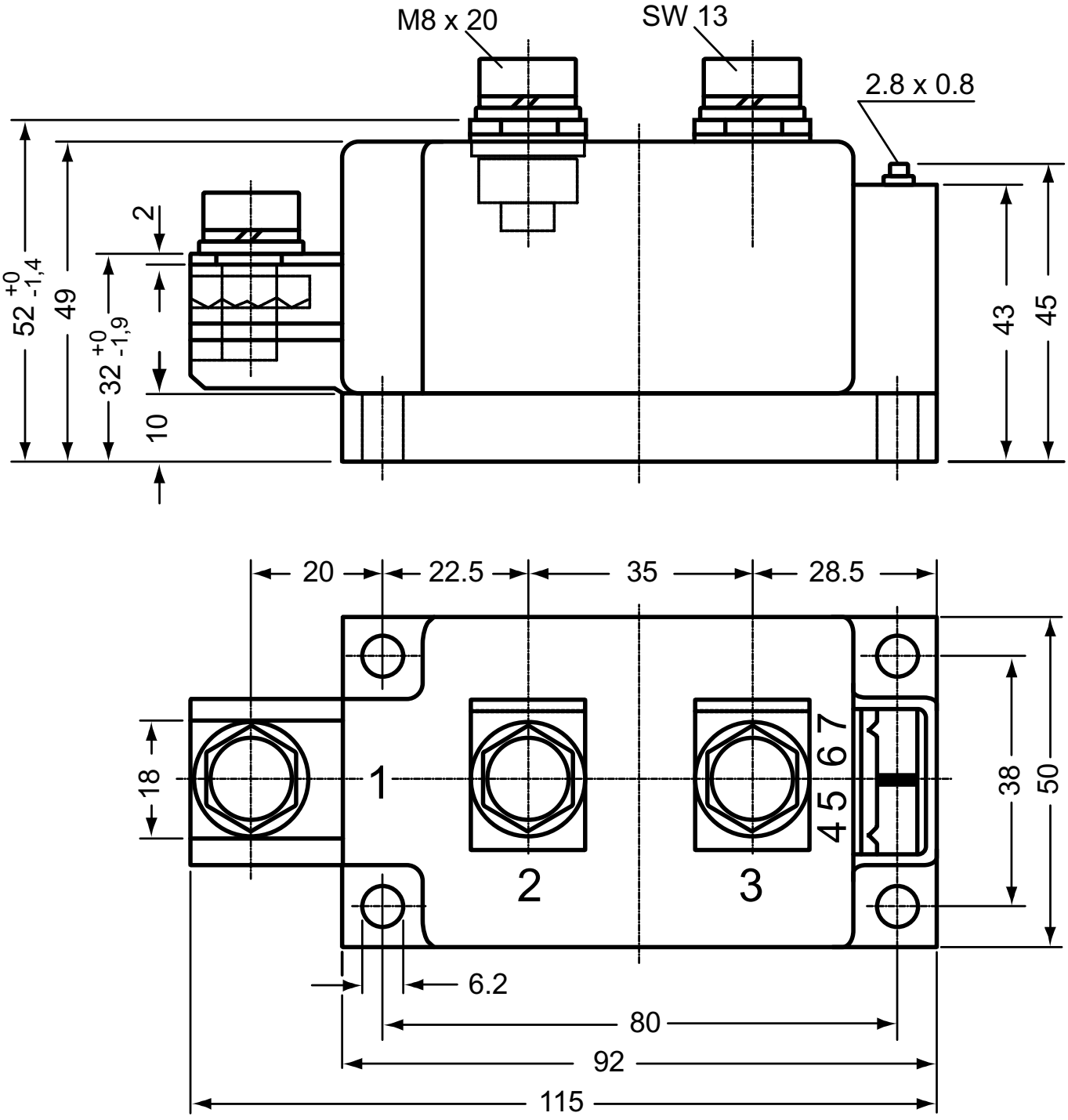
Applications

- 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

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

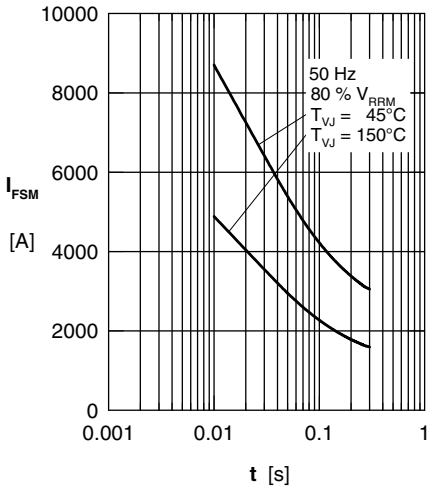


Fig. 1 Surge overload current
I_{FSM}: Crest value, t: duration

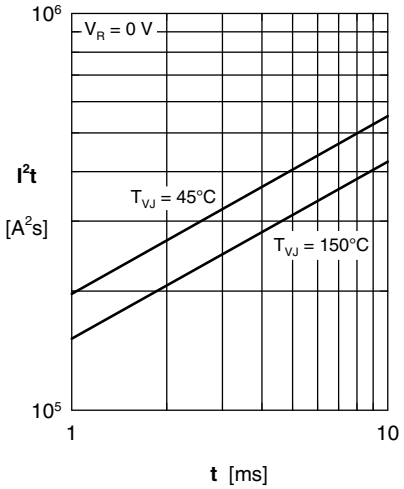


Fig. 2 I^2t versus time (1-10 ms)

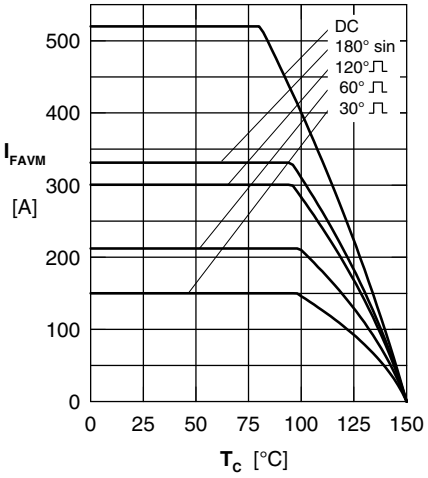


Fig. 3 Maximum forward current at case temperature

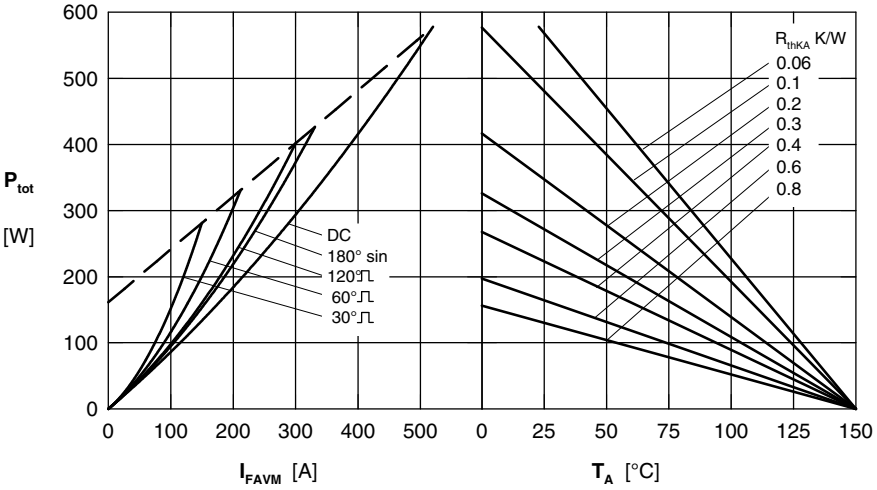


Fig. 4 Power dissipation vs. forward current & ambient temperature (per diode)

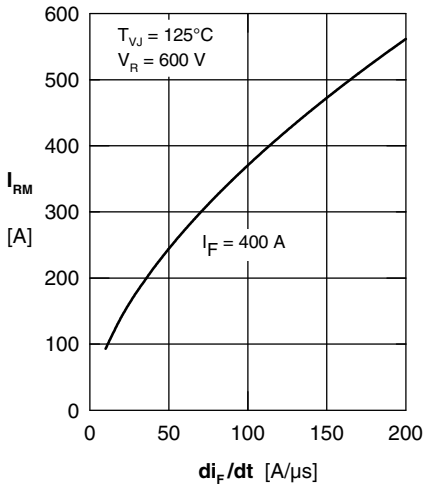


Fig. 5 Typ. peak reverse current

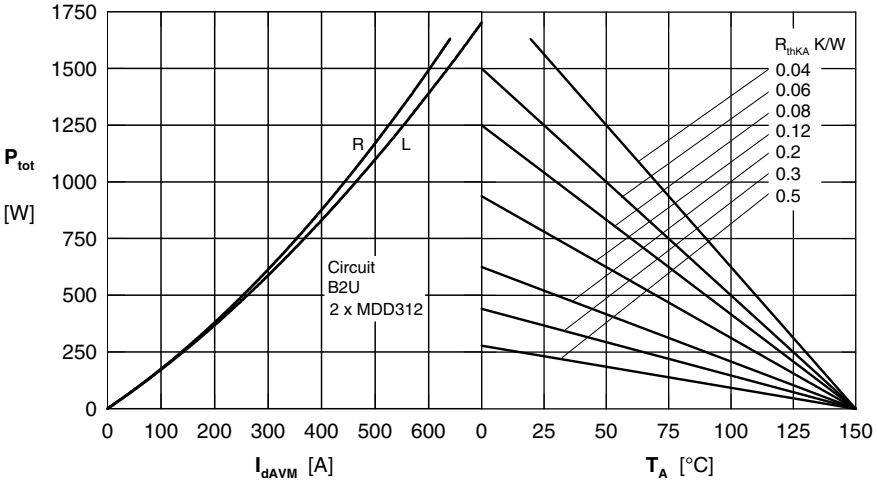


Fig. 6 Single phase rectifier bridge: Power dissipation vs. direct output current and ambient temperature *R = resistive load, L = inductive load*

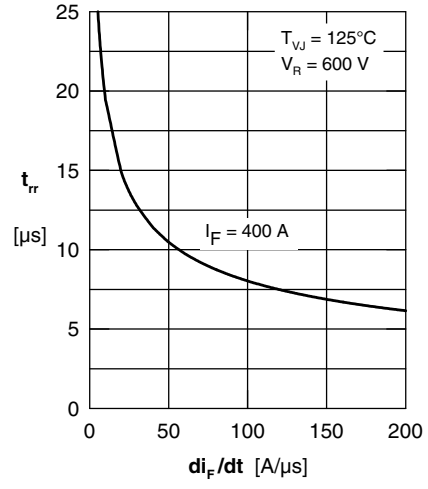


Fig. 7 Typ. recovery time t_{rr} versus $-di_F/dt$

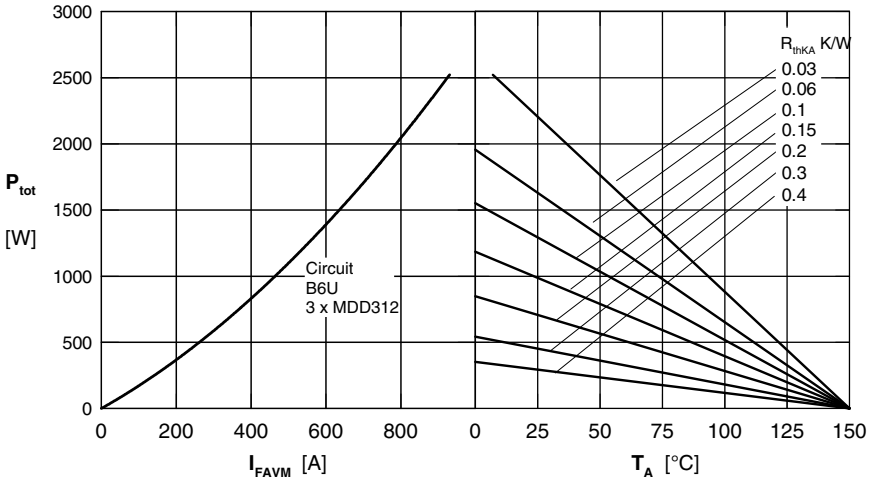


Fig. 8 Three phase rectifier bridge: Power dissipation vs. direct output current & ambient temperature

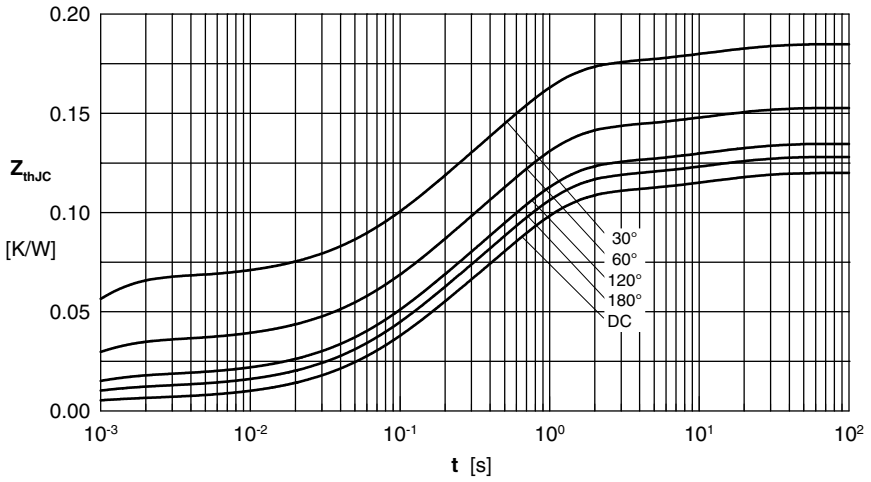


Fig. 9 Transient thermal impedance junction to case (per diode)

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

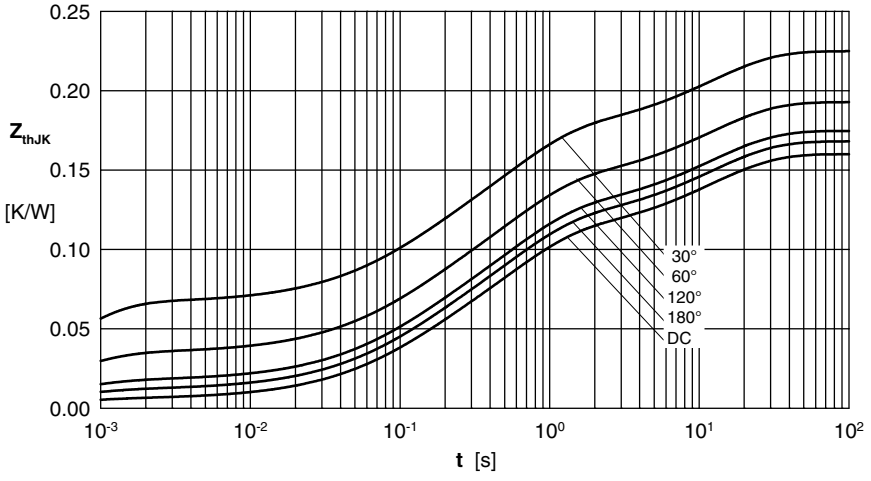


Fig. 10 Transient thermal impedance junction to heatsink (per diode)

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