

Standard Rectifier Module

$$V_{RRM} = 2 \times 1600 \text{ V}$$

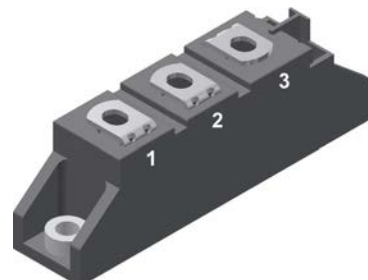
$$I_{FAV} = 85 \text{ A}$$

$$V_F = 1,1 \text{ V}$$

Phase leg

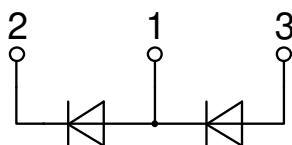
Part number

MDMA85P1600TG



Backside: isolated

 E72873



Features / Advantages:

- Package with DCB ceramic
- Improved temperature and power cycling
- Planar passivated chips
- Very low forward voltage drop
- Very low leakage current

Applications:

- Diode for main rectification
- For single and three phase bridge configurations
- Supplies for DC power equipment
- Input rectifiers for PWM inverter
- Battery DC power supplies
- Field supply for DC motors

Package: TO-240AA

- Isolation Voltage: 4800 V~
- Industry standard outline
- RoHS compliant
- Height: 30 mm
- Base plate: DCB ceramic
- Reduced weight
- Advanced power cycling

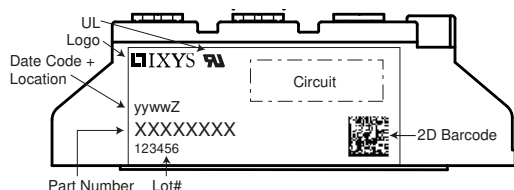
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Rectifier				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
V_{RSM}	<i>max. non-repetitive reverse blocking voltage</i>	$T_{VJ} = 25^{\circ}\text{C}$				1700	V
V_{RRM}	<i>max. repetitive reverse blocking voltage</i>	$T_{VJ} = 25^{\circ}\text{C}$				1600	V
I_R	<i>reverse current</i>	$V_R = 1600\text{ V}$	$T_{VJ} = 25^{\circ}\text{C}$			100	μA
		$V_R = 1600\text{ V}$	$T_{VJ} = 150^{\circ}\text{C}$			2	mA
V_F	<i>forward voltage drop</i>	$I_F = 85\text{ A}$	$T_{VJ} = 25^{\circ}\text{C}$			1,15	V
		$I_F = 170\text{ A}$				1,38	V
		$I_F = 85\text{ A}$	$T_{VJ} = 125^{\circ}\text{C}$			1,10	V
		$I_F = 170\text{ A}$				1,39	V
I_{FAV}	<i>average forward current</i>	$T_C = 100^{\circ}\text{C}$ rectangular $d = 0.5$	$T_{VJ} = 150^{\circ}\text{C}$			85	A
V_{F0}	<i>threshold voltage</i>	} <i>for power loss calculation only</i>		$T_{VJ} = 150^{\circ}\text{C}$		0,79	V
r_F	<i>slope resistance</i>					3,5	m Ω
R_{thJC}	<i>thermal resistance junction to case</i>					0,35	K/W
R_{thCH}	<i>thermal resistance case to heatsink</i>				0,2		K/W
P_{tot}	<i>total power dissipation</i>	$T_C = 25^{\circ}\text{C}$				350	W
I_{FSM}	<i>max. forward surge current</i>	$t = 10\text{ ms; (50 Hz), sine}$	$T_{VJ} = 45^{\circ}\text{C}$			1,50	kA
		$t = 8,3\text{ ms; (60 Hz), sine}$	$V_R = 0\text{ V}$			1,62	kA
		$t = 10\text{ ms; (50 Hz), sine}$	$T_{VJ} = 150^{\circ}\text{C}$			1,28	kA
		$t = 8,3\text{ ms; (60 Hz), sine}$	$V_R = 0\text{ V}$			1,38	kA
I^2t	<i>value for fusing</i>	$t = 10\text{ ms; (50 Hz), sine}$	$T_{VJ} = 45^{\circ}\text{C}$			11,3	kA ² s
		$t = 8,3\text{ ms; (60 Hz), sine}$	$V_R = 0\text{ V}$			10,9	kA ² s
		$t = 10\text{ ms; (50 Hz), sine}$	$T_{VJ} = 150^{\circ}\text{C}$			8,13	kA ² s
		$t = 8,3\text{ ms; (60 Hz), sine}$	$V_R = 0\text{ V}$			7,87	kA ² s
C_J	<i>junction capacitance</i>	$V_R = 400\text{ V; } f = 1\text{ MHz}$			60		pF



Package TO-240AA				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
I _{RMS}	<i>RMS current</i>	per terminal				200	A
T _{VJ}	<i>virtual junction temperature</i>			-40		150	°C
T _{op}	<i>operation temperature</i>			-40		125	°C
T _{stg}	<i>storage temperature</i>			-40		125	°C
Weight					76		g
M _D	<i>mounting torque</i>			2,5		4	Nm
M _T	<i>terminal torque</i>			2,5		4	Nm
d _{Spp/App}	<i>creepage distance on surface striking distance through air</i>	<i>terminal to terminal</i>	13,0	9,7			mm
d _{Spb/Apb}		<i>terminal to backside</i>	16,0	16,0			mm
V _{ISOL}	<i>isolation voltage</i>	t = 1 second	50/60 Hz, RMS; I _{ISOL} ≤ 1 mA		4800		V
		t = 1 minute			4000		V



Part description

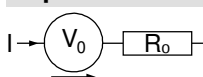
M = Module
D = Diode
M = Standard Rectifier
A = (up to 1800V)
85 = Current Rating [A]
P = Phase leg
1600 = Reverse Voltage [V]
TG = TO-240AA

Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	MDMA85P1600TG	MDMA85P1600TG	Box	36	513008

Equivalent Circuits for Simulation

* on die level

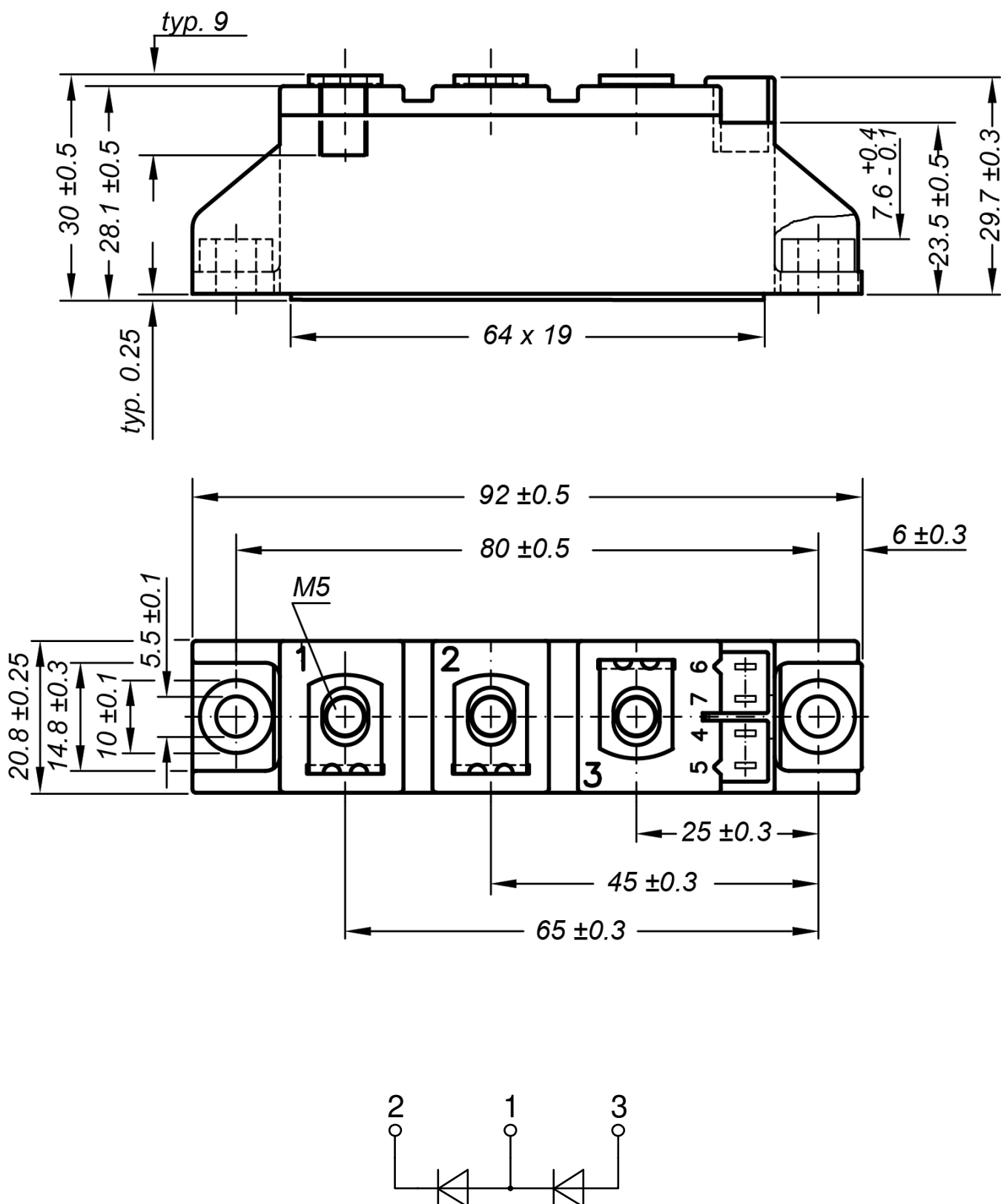
$T_{VJ} = 150^{\circ}\text{C}$



Rectifier

$V_{0\max}$	threshold voltage	0,79	V
$R_{0\max}$	slope resistance *	2,3	mΩ

Outlines TO-240AA



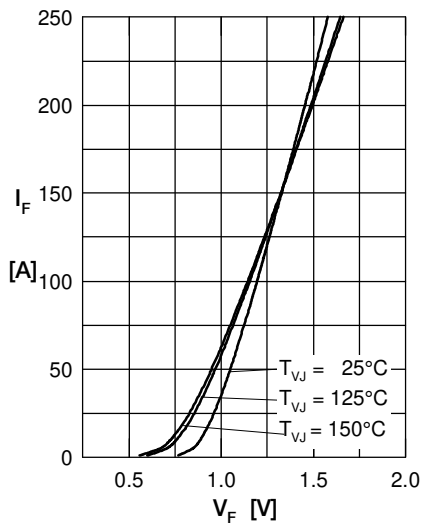
Rectifier


Fig. 1 Forward current versus voltage drop per diode

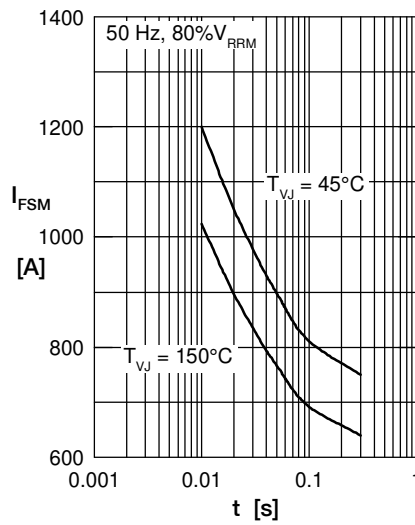


Fig. 2 Surge overload current vs. time per diode

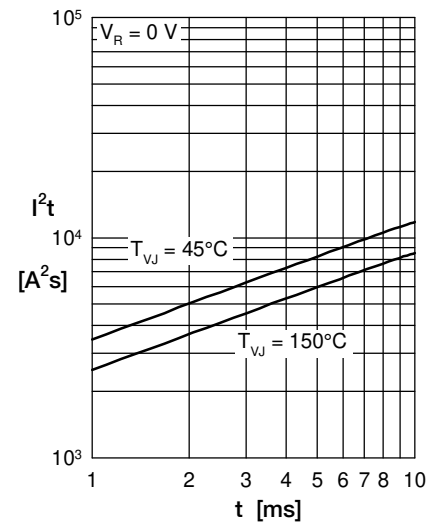
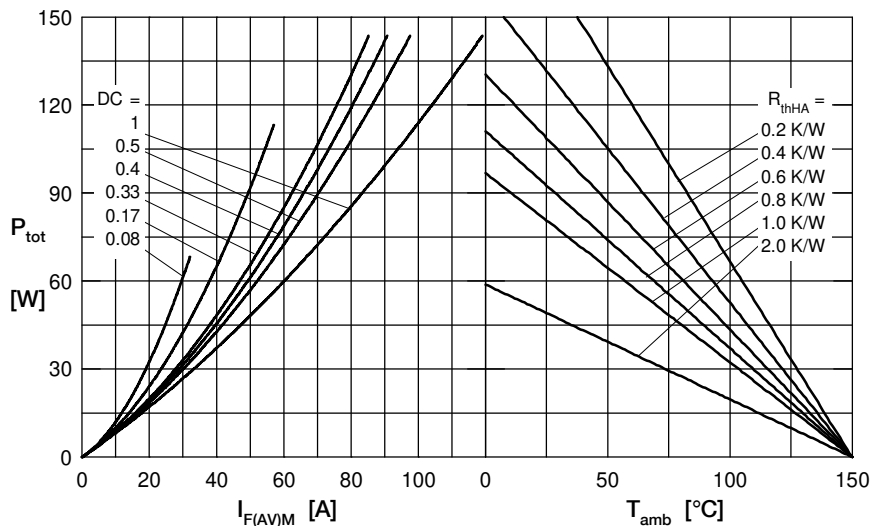

 Fig. 3 I^2t versus time per diode


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

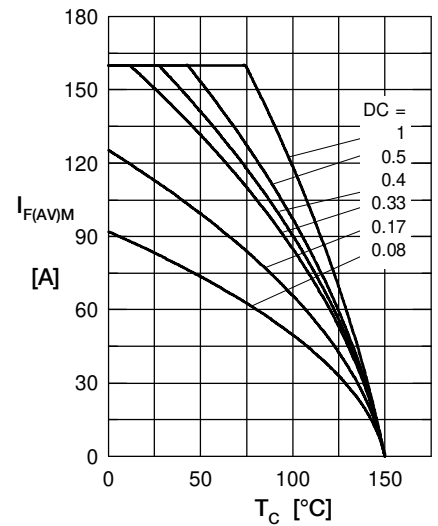


Fig. 5 Max. forward current vs. case temperature per diode

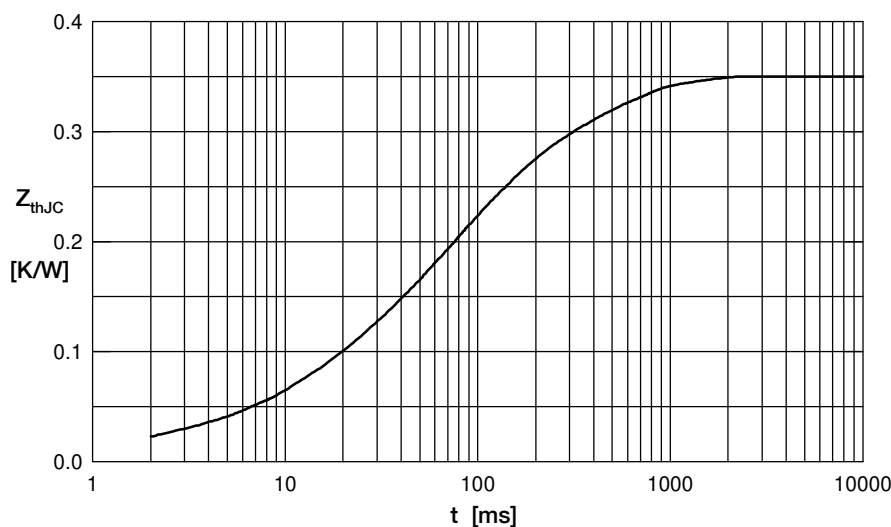


Fig. 6 Transient thermal impedance junction to case vs. time per diode

 Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.012	0.001
2	0.048	0.013
3	0.185	0.070
4	0.105	0.400