

Standard Rectifier Module

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

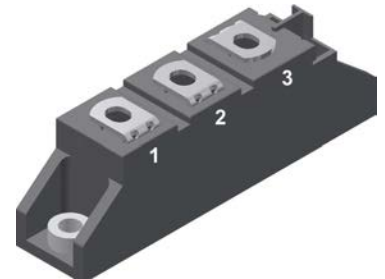
$$I_{FAV} = 85 \text{ A}$$

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

Phase leg

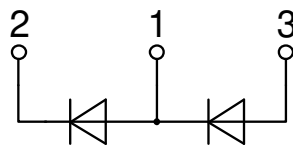
Part number

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

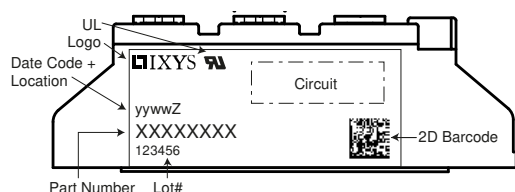
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Rectifier				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
V_{RSM}	<i>max. non-repetitive reverse blocking voltage</i>	$T_{VJ} = 25^{\circ}\text{C}$				1700	V
V_{RRM}	<i>max. repetitive reverse blocking voltage</i>	$T_{VJ} = 25^{\circ}\text{C}$				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}	RMS current	per terminal				200	A
T_{VJ}	virtual junction temperature			-40		150	°C
T_{op}	operation temperature			-40		125	°C
T_{stg}	storage temperature			-40		125	°C
Weight					76		g
M_D	mounting torque			2,5		4	Nm
M_T	terminal torque			2,5		4	Nm
$d_{Spp/App}$	creepage distance on surface striking distance through air	terminal to terminal	13,0	9,7			mm
$d_{Spb/Apb}$		terminal to backside	16,0	16,0			mm
V_{ISOL}	isolation voltage	t = 1 second	50/60 Hz, RMS; $I_{ISOL} \leq 1$ mA	4800			V
		t = 1 minute		4000			V



Part description

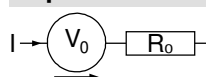
M = Module
 D = Diode
 M = Standard Rectifier
 A = (up to 1800V)
 85 = Current Rating [A]
 P = Phase leg
 1600 = Reverse Voltage [V]
 TG = TO-240AA

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

Equivalent Circuits for Simulation

* on die level

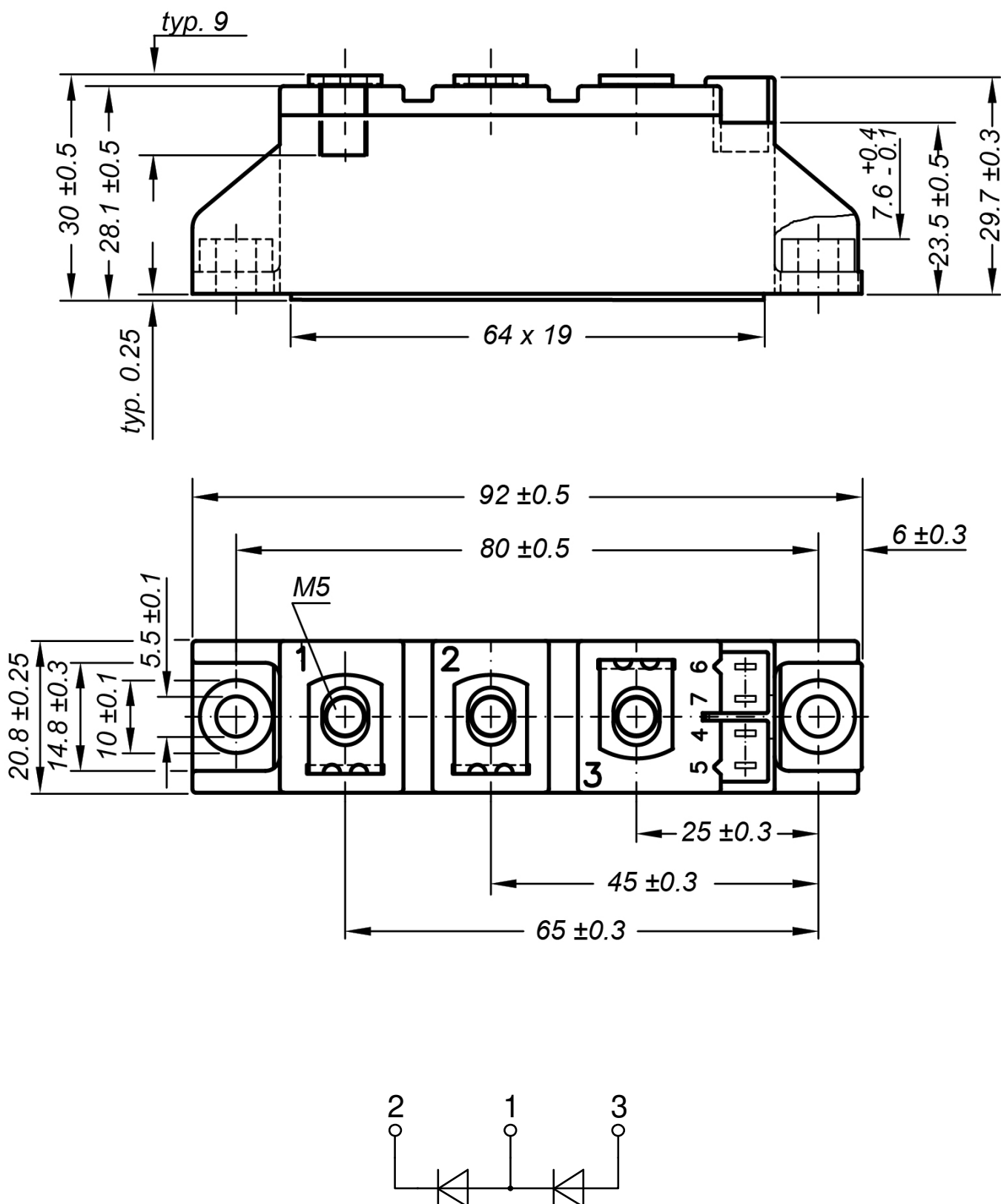
$T_{VJ} = 150^{\circ}\text{C}$



Rectifier

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

Outlines TO-240AA



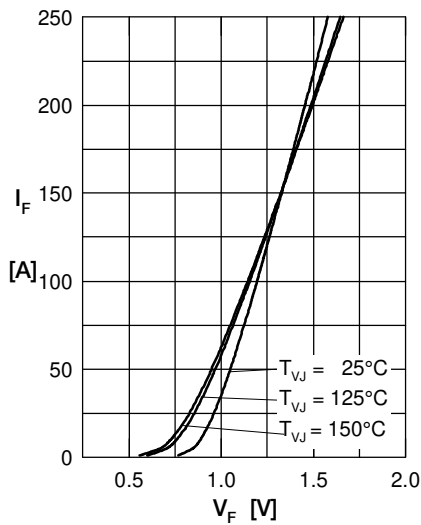
Rectifier


Fig. 1 Forward current versus voltage drop per diode

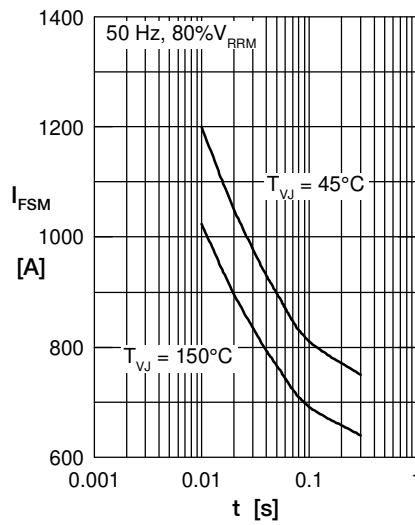


Fig. 2 Surge overload current vs. time per diode

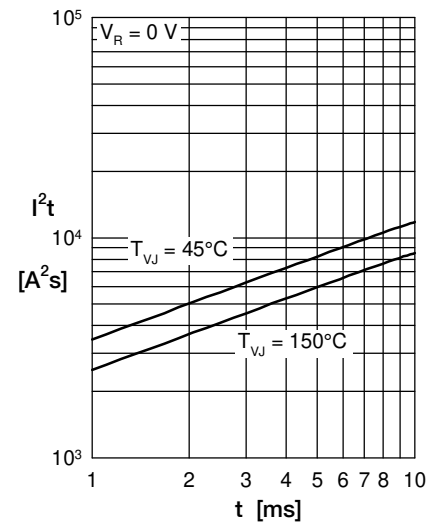
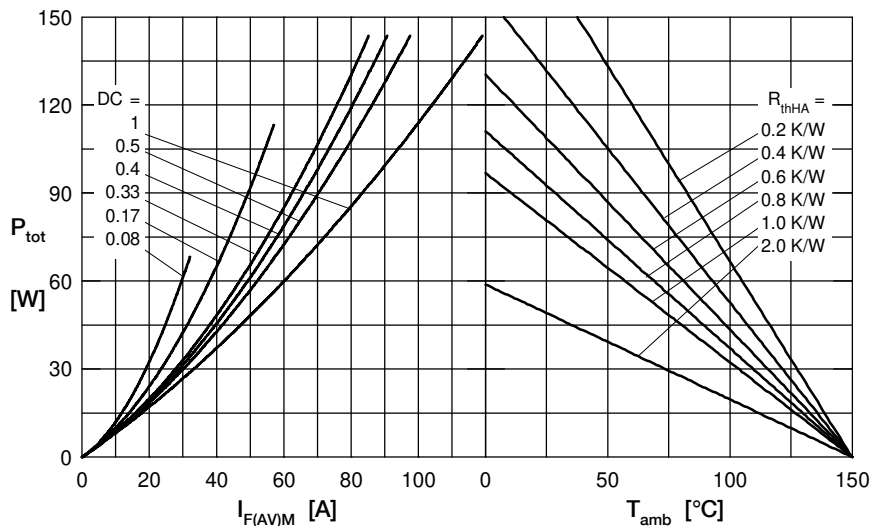

 Fig. 3 I^2t versus time per diode


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

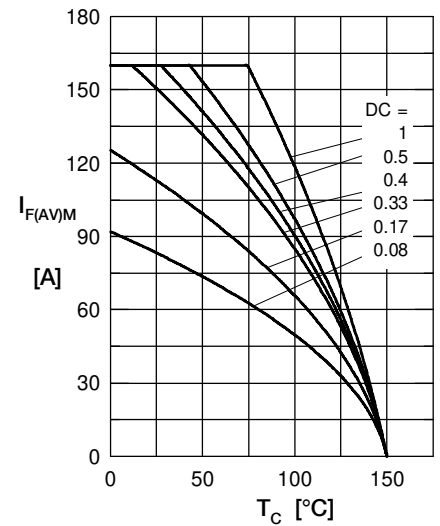


Fig. 5 Max. forward current vs. case temperature per diode

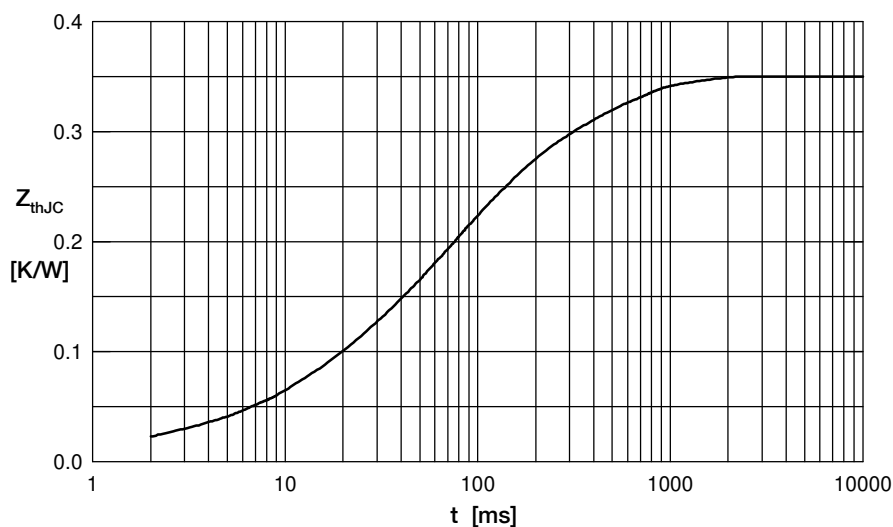


Fig. 6 Transient thermal impedance junction to case vs. time per diode

 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