

Standard Rectifier Module

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

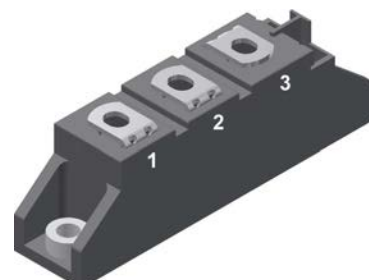
$$I_{FAV} = 35 \text{ A}$$

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

Phase leg

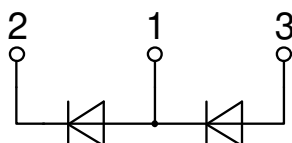
Part number

MDMA35P1600TG



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

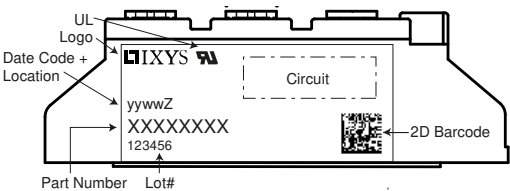
- Isolation Voltage: 4800 V~
- Industry standard outline
- RoHS compliant
- Height: 30 mm
- Base plate: DCB ceramic
- Reduced weight
- Advanced power cycling

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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>	$V_R = 1600\text{ V}$	$T_{VJ} = 25^{\circ}\text{C}$			20	μA
		$V_R = 1600\text{ V}$	$T_{VJ} = 150^{\circ}\text{C}$			1,5	mA
V_F	<i>forward voltage drop</i>	$I_F = 35\text{ A}$	$T_{VJ} = 25^{\circ}\text{C}$			1,15	V
		$I_F = 70\text{ A}$				1,34	V
		$I_F = 35\text{ A}$	$T_{VJ} = 125^{\circ}\text{C}$			1,10	V
		$I_F = 70\text{ A}$				1,35	V
I_{FAV}	<i>average forward current</i>	$T_C = 100^{\circ}\text{C}$ rectangular $d = 0.5$	$T_{VJ} = 150^{\circ}\text{C}$			35	A
V_{F0}	<i>threshold voltage</i>	} <i>for power loss calculation only</i>		$T_{VJ} = 150^{\circ}\text{C}$		0,83	V
r_F	<i>slope resistance</i>					7,3	m Ω
R_{thJC}	<i>thermal resistance junction to case</i>					0,9	K/W
R_{thCH}	<i>thermal resistance case to heatsink</i>				0,2		K/W
P_{tot}	<i>total power dissipation</i>	$T_C = 25^{\circ}\text{C}$				130	W
I_{FSM}	<i>max. forward surge current</i>	$t = 10\text{ ms; (50 Hz), sine}$	$T_{VJ} = 45^{\circ}\text{C}$			500	A
		$t = 8,3\text{ ms; (60 Hz), sine}$	$V_R = 0\text{ V}$			540	A
		$t = 10\text{ ms; (50 Hz), sine}$	$T_{VJ} = 150^{\circ}\text{C}$			425	A
		$t = 8,3\text{ ms; (60 Hz), sine}$	$V_R = 0\text{ V}$			460	A
I^2t	<i>value for fusing</i>	$t = 10\text{ ms; (50 Hz), sine}$	$T_{VJ} = 45^{\circ}\text{C}$			1,25	kA ² s
		$t = 8,3\text{ ms; (60 Hz), sine}$	$V_R = 0\text{ V}$			1,22	kA ² s
		$t = 10\text{ ms; (50 Hz), sine}$	$T_{VJ} = 150^{\circ}\text{C}$			905	A ² s
		$t = 8,3\text{ ms; (60 Hz), sine}$	$V_R = 0\text{ V}$			880	A ² s
C_J	<i>junction capacitance</i>	$V_R = 400\text{ V; } f = 1\text{ MHz}$			19		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} ≤ 1 mA	4800			V
		t = 1 minute		4000			V



Part description

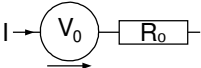
- M = Module
- D = Diode
- M = Standard Rectifier
- A = (up to 1800V)
- 35 = Current Rating [A]
- P = Phase leg
- 1600 = Reverse Voltage [V]
- TG = TO-240AA

Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	MDMA35P1600TG	MDMA35P1600TG	Box	36	515014

Equivalent Circuits for Simulation

* on die level

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



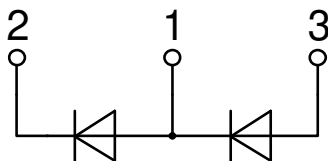
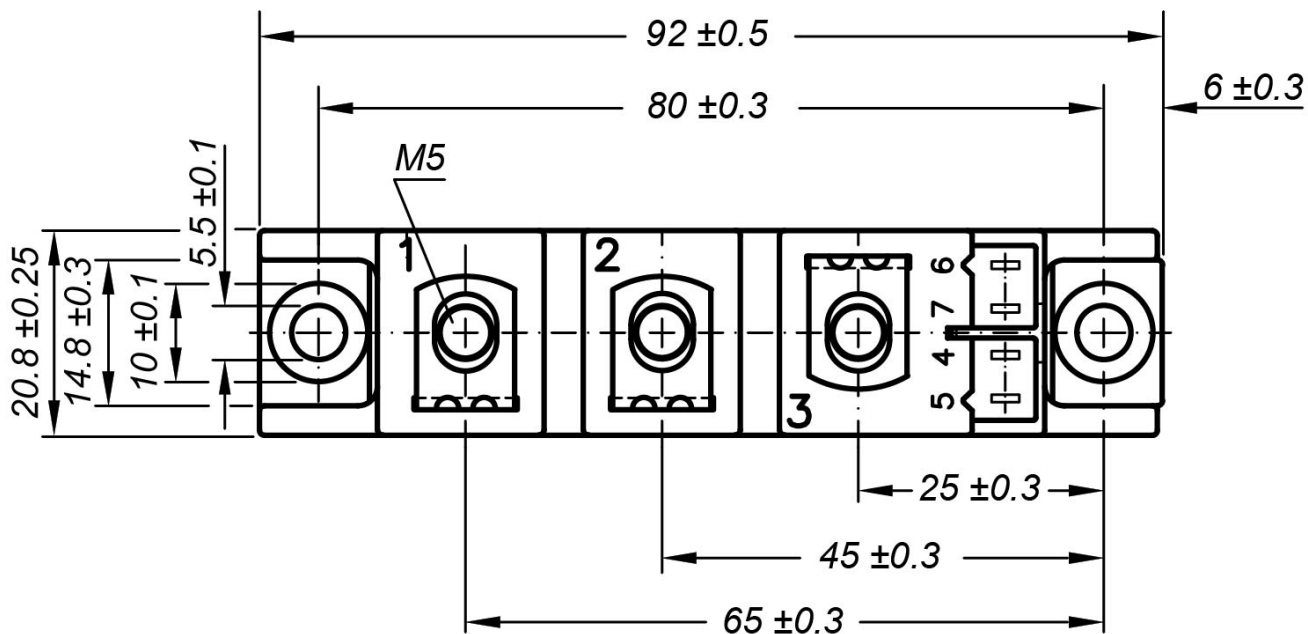
Rectifier

$V_{0\text{ max}}$
threshold voltage
0,83
V

$R_{0\text{ max}}$
*slope resistance **
6,1
mΩ

Technical drawing of a rectangular box with dimensions and tolerances:

- Overall width: 30 ± 0.5
- Overall height: 28.1 ± 0.5
- Internal width: 23.5 ± 0.5
- Internal height: 29.7 ± 0.3
- Top flange height: $7.6^{+0.4}_{-0.1}$
- Bottom flange height: 0.25 (typ. 0.25)
- Top flange width: 64×19
- Top flange thickness: 0.9 (typ. 0.9)



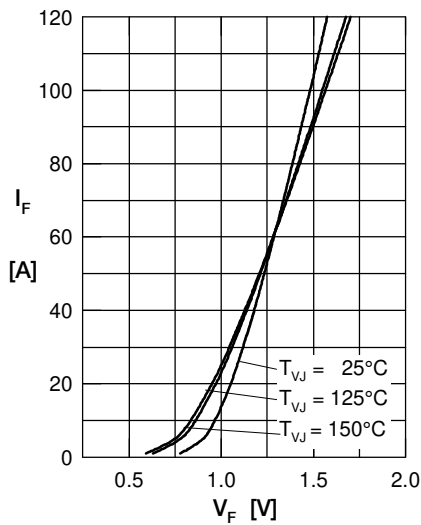
Rectifier


Fig. 1 Forward current versus voltage drop per diode

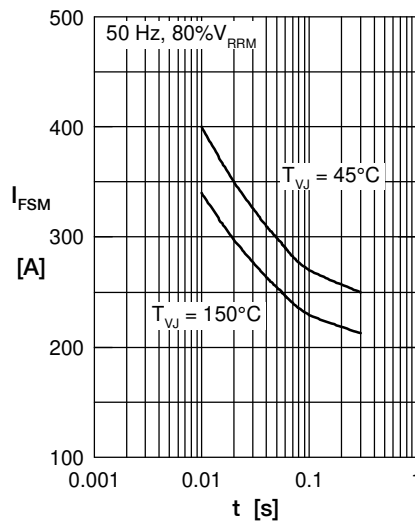


Fig. 2 Surge overload current vs. time per diode

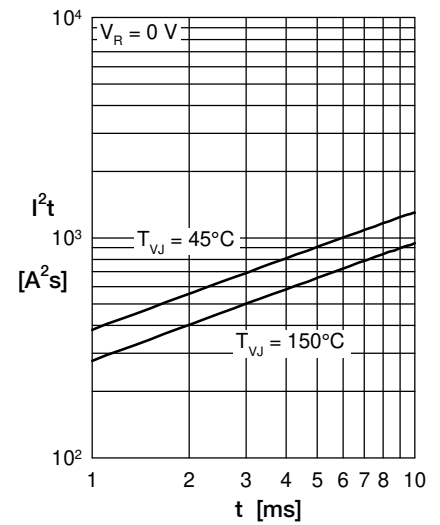
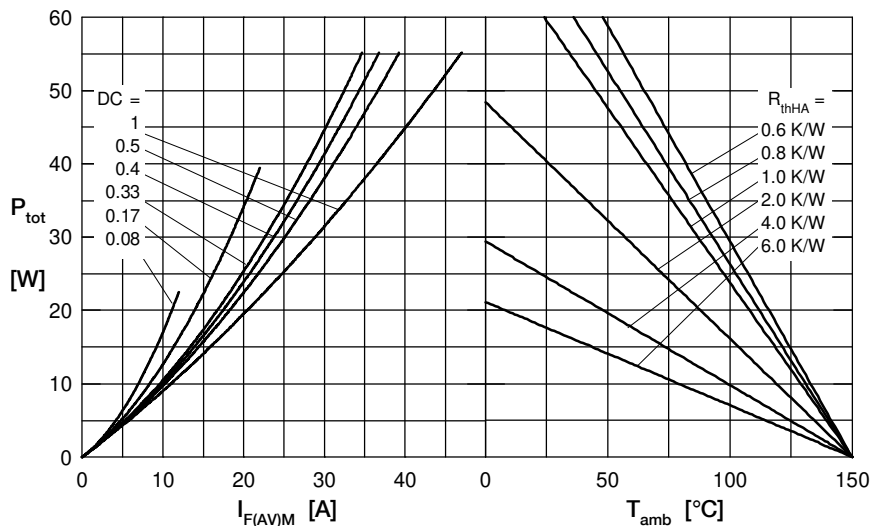

 Fig. 3 I^2t versus time per diode


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

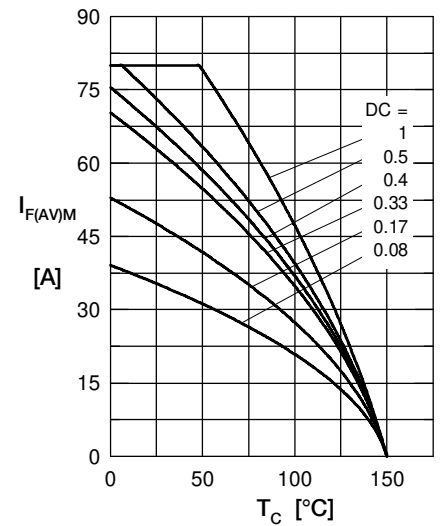


Fig. 5 Max. forward current vs. case temperature per diode

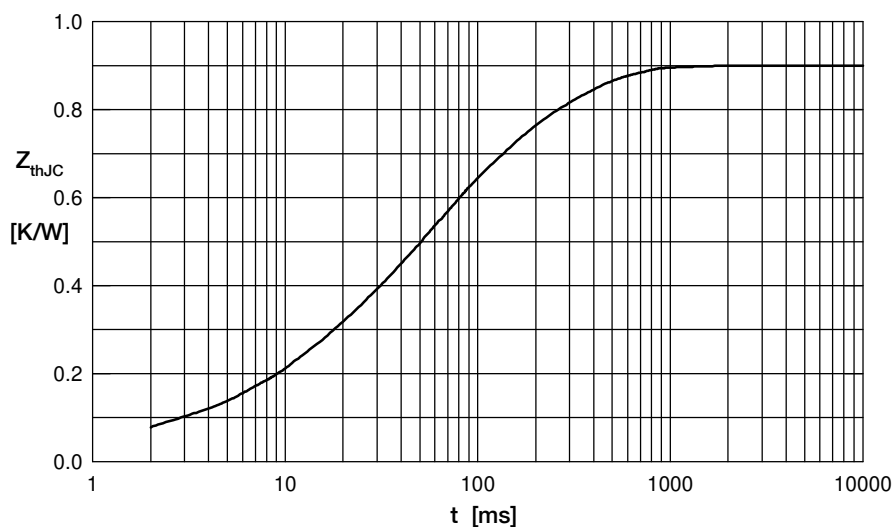


Fig. 6 Transient thermal impedance junction to case vs. time per diode

 Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.042	0.001
2	0.128	0.010
3	0.425	0.050
4	0.305	0.230