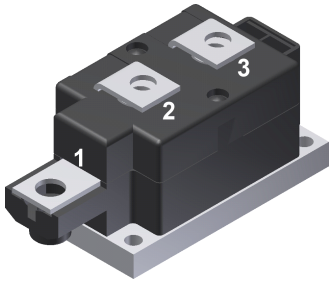
Standard Rectifier Module

V_{RRM} = 2x 1600 V
I_{FAV} = 380 A
V_F = 0.93 V

Phase leg

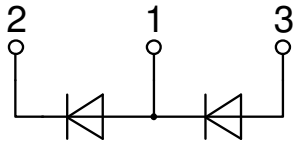
Part number

MDMA380P1600KC



Backside: isolated

E72873



Features / Advantages:

- Planar passivated chips
- Very low leakage current
- Very low forward voltage drop
- Improved thermal behaviour

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: Y1

- Isolation Voltage: 4800 V~
- Industry standard outline
- RoHS compliant
- Base plate: Copper internally DCB isolated
- Advanced power cycling

Terms _Conditions of usage:

The data contained in this product data sheet is exclusively intended for technically trained staff. The user will have to evaluate the suitability of the product for the intended application and the completeness of the product data with respect to his application. The specifications of our components may not be considered as an assurance of component characteristics. The information in the valid application- and assembly notes must be considered. Should you require product information in excess of the data given in this product data sheet or which concerns the specific application of your product, please contact your local sales office.
Due to technical requirements our product may contain dangerous substances. For information on the types in question please contact your local sales office.
Should you intend to use the product in aviation, in health or life endangering or life support applications, please notify. For any such application we urgently recommend
- to perform joint risk and quality assessments;
- the conclusion of quality agreements;
- to establish joint measures of an ongoing product survey, and that we may make delivery dependent on the realization of any such measures.

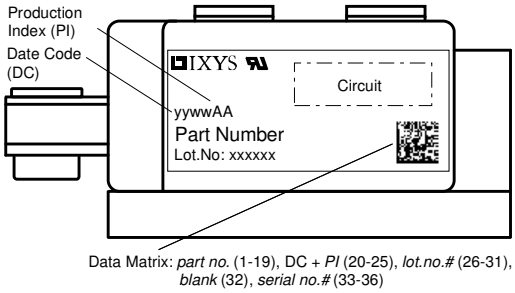
IXYS reserves the right to change limits, conditions and dimensions. Data according to IEC 60747and per semiconductor unless otherwise specified 20170116c

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Rectifier				Ratings			
Symbol	**Definition**	**Conditions**		**min.**	**typ.**	**max.**	**Unit**
V_{RSM}	*max. non-repetitive reverse blocking voltage*		T_{VJ} = 25°C			1700	V
V_{RRM}	*max. repetitive reverse blocking voltage*		T_{VJ} = 25°C			1600	V
I_R	*reverse current*	V_R = 1600 V	T_{VJ} = 25°C			500	µA
		V_R = 1600 V	T_{VJ} = 150°C			20	mA
V_F	*forward voltage drop*	I_F = 300 A	T_{VJ} = 25°C			1.05	V
		I_F = 600 A				1.18	V
		I_F = 300 A	T_{VJ} = 125°C			0.93	V
		I_F = 600 A				1.10	V
I_{FAV}	*average forward current*	T_C = 100°C	T_{VJ} = 150°C			380	A
		rectangular d = 0.5					
V_{F0}	*threshold voltage* } *for power loss calculation only*		T_{VJ} = 150°C			0.75	V
r_F	*slope resistance* }					0.53	mΩ
R_{thJC}	*thermal resistance junction to case*					0.11	K/W
R_{thCH}	*thermal resistance case to heatsink*				0.04		K/W
P_{tot}	*total power dissipation*		T_C = 25°C			1140	W
I_{FSM}	*max. forward surge current*	t = 10 ms; (50 Hz), sine	T_{VJ} = 45°C			11.0	kA
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			11.9	kA
		t = 10 ms; (50 Hz), sine	T_{VJ} = 150°C			9.35	kA
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			10.1	kA
I^2t	*value for fusing*	t = 10 ms; (50 Hz), sine	T_{VJ} = 45°C			605.0	kA²s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			587.1	kA²s
		t = 10 ms; (50 Hz), sine	T_{VJ} = 150°C			437.1	kA²s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			424.4	kA²s
C_J	*junction capacitance*	V_R = 400 V; f = 1 MHz	T_{VJ} = 25°C		27		pF

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Package Y1				Ratings			
Symbol	**Definition**	**Conditions**		**min.**	**typ.**	**max.**	**Unit**
I_{RMS}	*RMS current*	per terminal				600	A
T_{VJ}	*virtual junction temperature*			-40		150	°C
T_{op}	*operation temperature*			-40		125	°C
T_{stg}	*storage temperature*			-40		125	°C
Weight					680		g
M_D	*mounting torque*			4.5		7	Nm
M_T	*terminal torque*			11		13	Nm
$d_{Spp/App}$	*creepage distance on surface | striking distance through air*		*terminal to terminal*	16.0			mm
$d_{Spb/Apb}$			*terminal to backside*	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



Data Matrix: *part no.* (1-19), DC + *PI* (20-25), *lot.no.#* (26-31), *blank* (32), *serial no.#* (33-36)

Part description

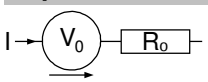
M = Module
D = Diode
M = Standard Rectifier
A = (up to 1800V)
380 = Current Rating [A]
P = Phase leg
1600 = Reverse Voltage [V]
KC = Y1-CU

Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	MDMA380P1600KC	MDMA380P1600KC	Box	3	512611

Similar Part	Package	Voltage class
MDNA380P2200KC	Y1-CU	2200

Equivalent Circuits for Simulation

** on die level* T_{VJ} = 150 °C

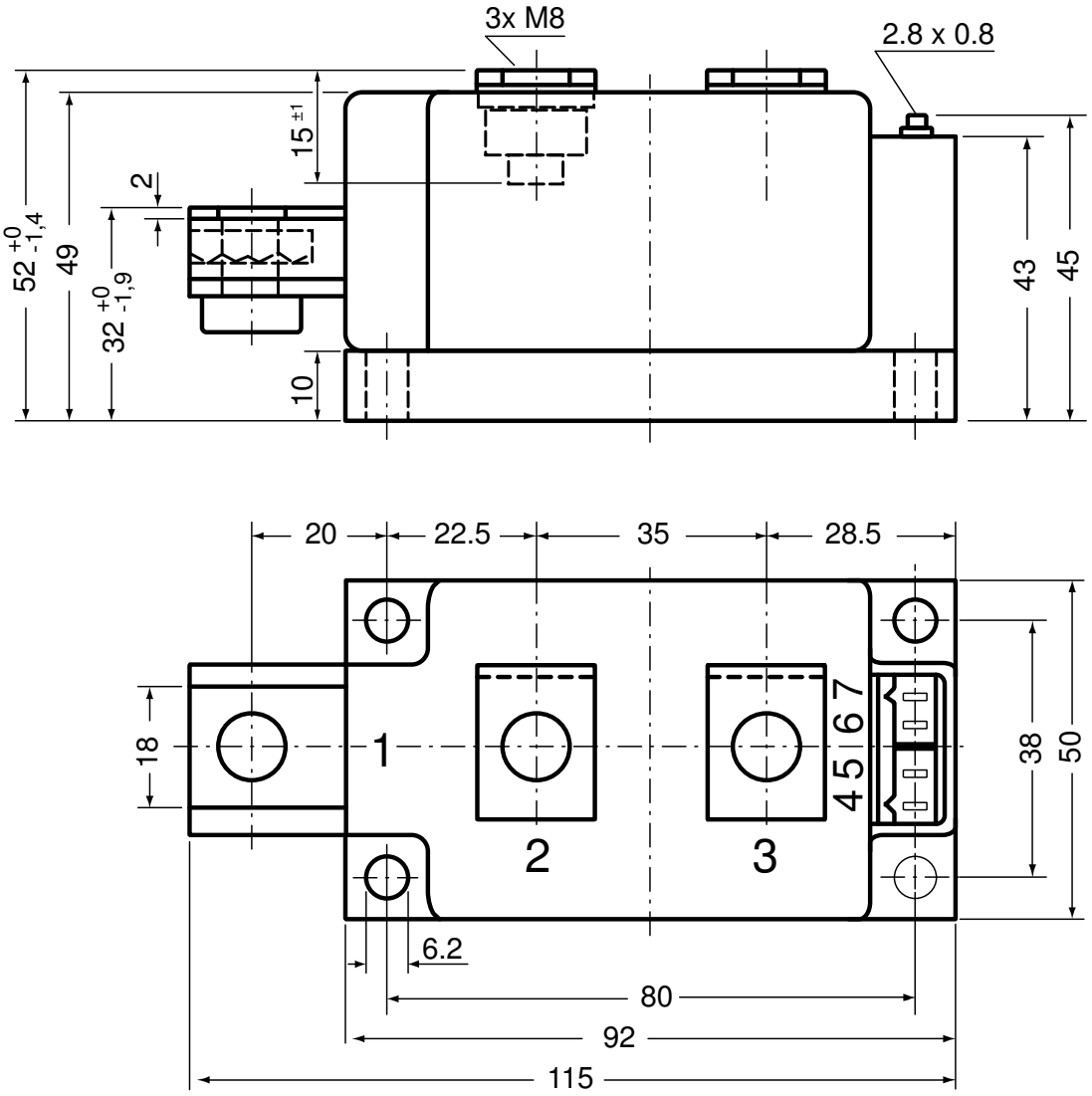


Rectifier

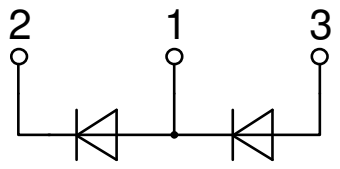
$V_{0\,max}$	*threshold voltage*	0.75	V
$R_{0\,max}$	*slope resistance **	0.34	mΩ

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Outlines Y1



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



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Rectifier

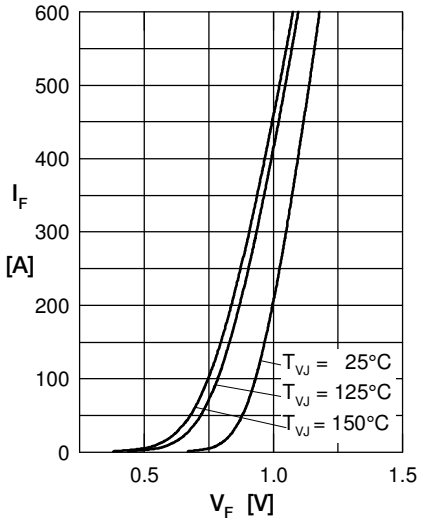


Fig. 1 Forward current versus voltage drop per diode

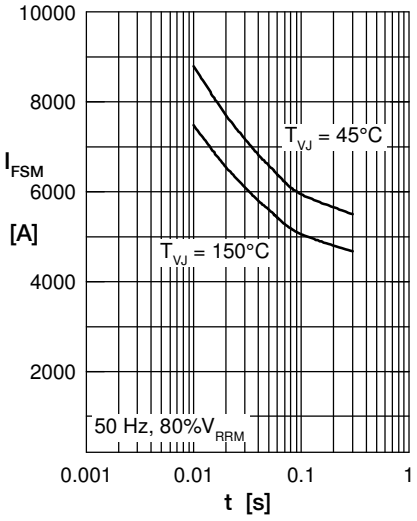


Fig. 2 Surge overload current vs. time per diode

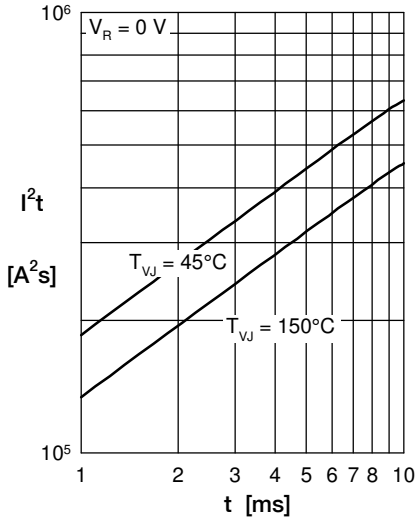


Fig. 3 I^2t versus time per diode

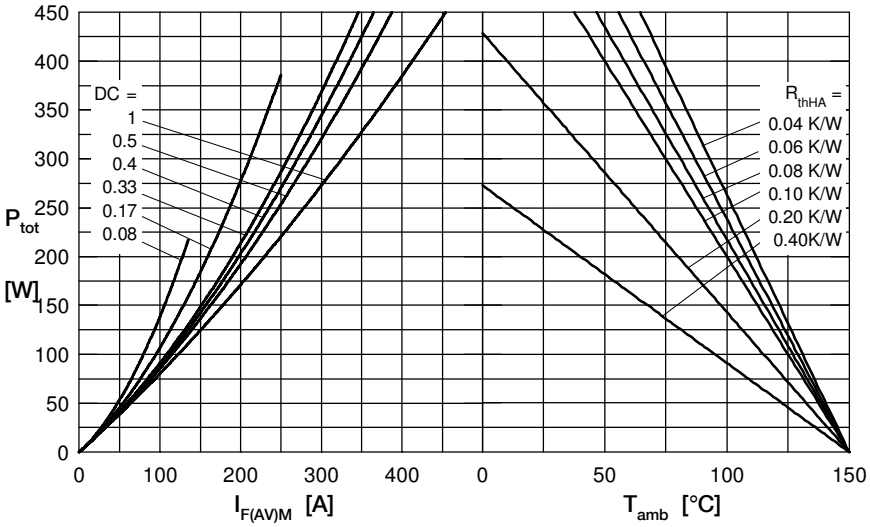


Fig. 4 Power dissipation vs. forward current and ambient temperature per diode

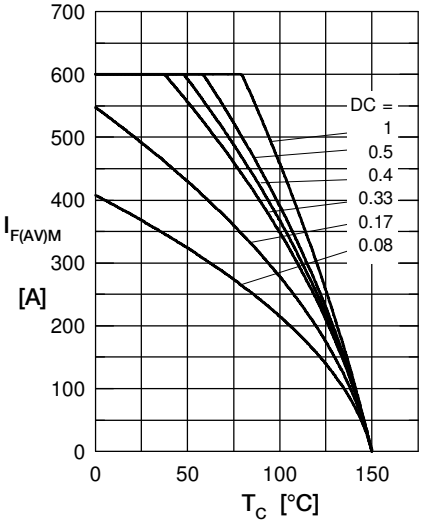


Fig. 5 Max. forward current vs. case temperature per diode

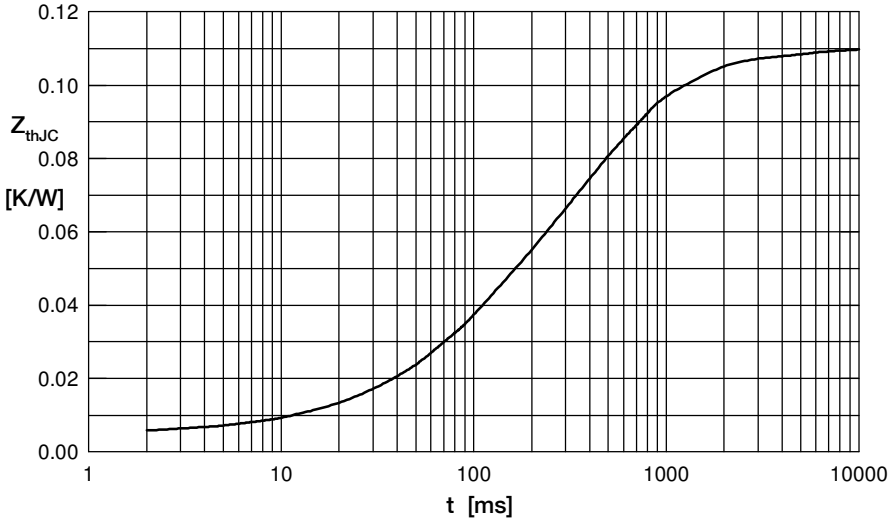


Fig. 6 Transient thermal impedance junction to case vs. time per diode

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.005	0.0005
2	0.029	0.0980
3	0.068	0.4500
4	0.008	3.0000

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