Standard Rectifier Module

V_{RRM} = 2x 1600 V
I_{FAV} = 700 A
V_F = 1.05 V

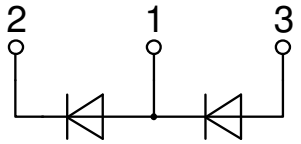
Phase leg

Part number

MDMA700P1600CC

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: ComPack

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

Terms and 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.

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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 = 700 A	T_{VJ} = 25°C			1.14	V
		I_F = 1400 A				1.35	V
		I_F = 700 A	T_{VJ} = 125°C			1.05	V
		I_F = 1400 A				1.30	V
I_{FAV}	*average forward current*	T_C = 100°C	T_{VJ} = 150°C			700	A
		rectangular d = 0.5					
V_{F0}	*threshold voltage* } *for power loss calculation only*		T_{VJ} = 150°C			0.78	V
r_F	*slope resistance* }					0.35	mΩ
R_{thJC}	*thermal resistance junction to case*					0.055	K/W
R_{thCH}	*thermal resistance case to heatsink*				0.02		K/W
P_{tot}	*total power dissipation*		T_C = 25°C			2270	W
I_{FSM}	*max. forward surge current*	t = 10 ms; (50 Hz), sine	T_{VJ} = 45°C			20.0	kA
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			21.6	kA
		t = 10 ms; (50 Hz), sine	T_{VJ} = 150°C			17.0	kA
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			18.4	kA
I^2t	*value for fusing*	t = 10 ms; (50 Hz), sine	T_{VJ} = 45°C			2.00	MA^2s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			1.94	MA^2s
		t = 10 ms; (50 Hz), sine	T_{VJ} = 150°C			1.45	MA^2s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			1.40	MA^2s
C_J	*junction capacitance*	V_R = 400 V; f = 1 MHz	T_{VJ} = 25°C		781		pF

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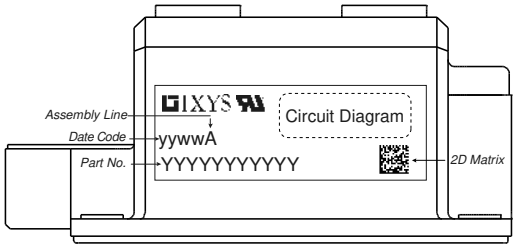
Package ComPack				Ratings			
Symbol	**Definition**	**Conditions**		**min.**	**typ.**	**max.**	**Unit**
I_{RMS}	*RMS current*	per terminal				1200	A
T_{VJ}	*virtual junction temperature*			-40		150	°C
T_{op}	*operation temperature*			-40		125	°C
T_{stg}	*storage temperature*			-40		125	°C
Weight					500		g
M_D	*mounting torque*			3		5	Nm
M_T	*terminal torque*			12		14	Nm
$d_{Spp/App}$	*creepage distance on surface | striking distance through air*		*terminal to terminal*	21.0			mm
$d_{Spb/Apb}$			*terminal to backside*	18.0			mm
V_{ISOL}	*isolation voltage*	t = 1 second	50/60 Hz, RMS; I_{ISOL} ≤ 1 mA	4800			V
		t = 1 minute		4000			V



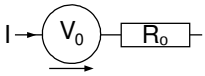
Part description

M = Module
D = Diode
M = Standard Rectifier
A = (up to 1800V)
700 = Current Rating [A]
P = Phase leg
1600 = Reverse Voltage [V]
CC = ComPack

Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	MDMA700P1600CC	MDMA700P1600CC	Box	3	514708

Equivalent Circuits for Simulation

** on die level* T_{VJ} = 150 °C



Rectifier

$V_{0\,max}$	*threshold voltage*	0.78	V
$R_{0\,max}$	*slope resistance **	0.16	mΩ

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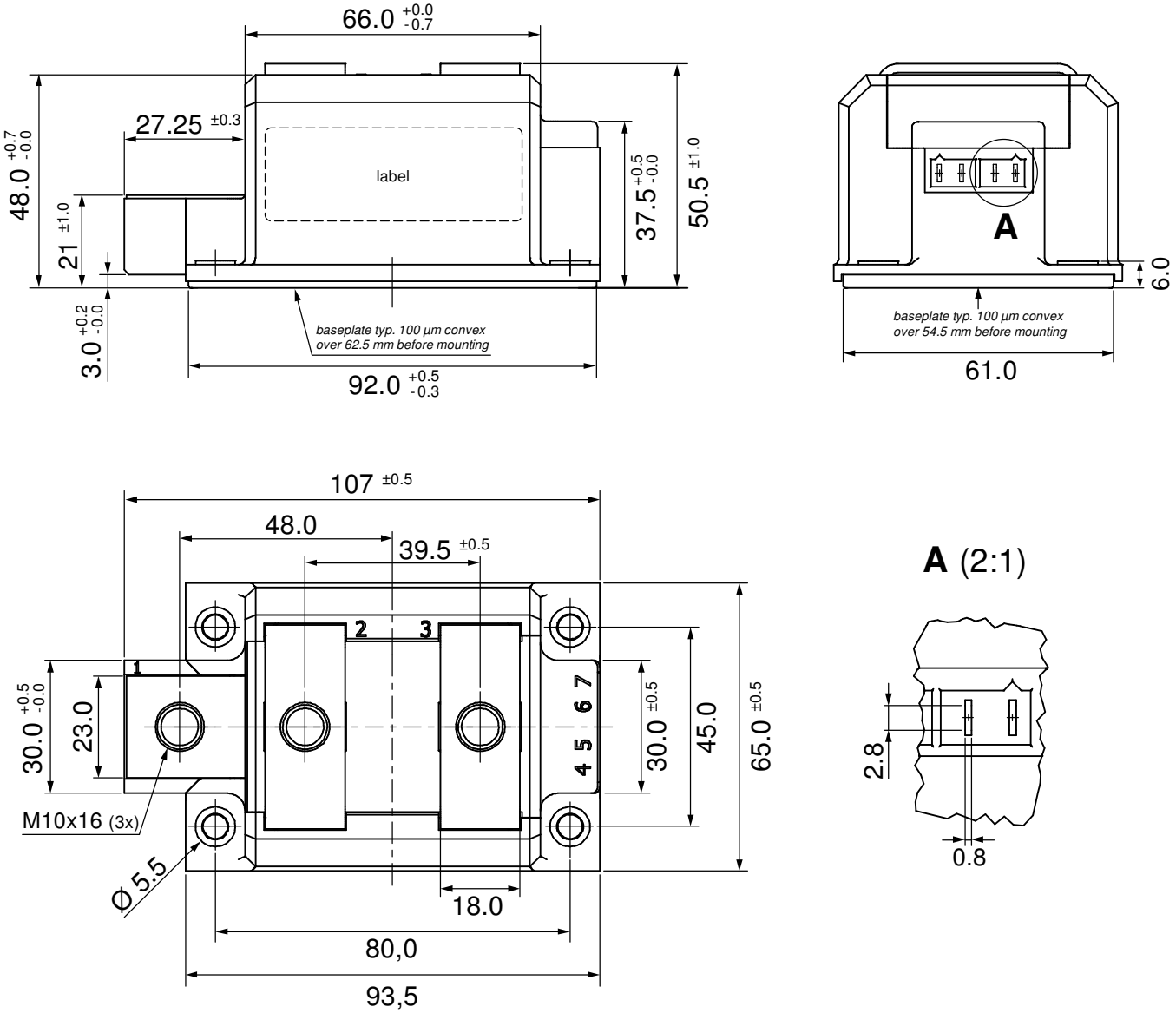
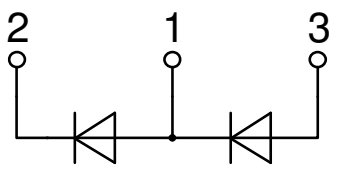
Outlines ComPack





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Rectifier

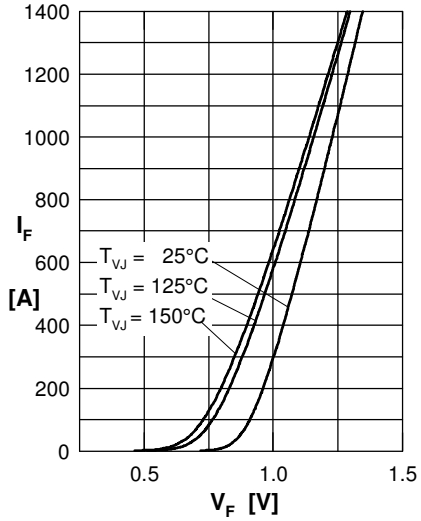

Fig. 1 Forward current versus voltage drop per diode

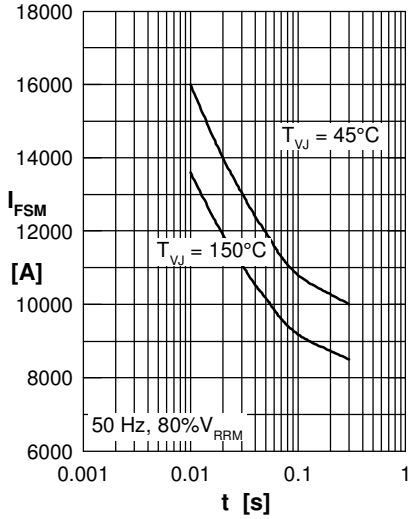

Fig. 2 Surge overload current vs. time per diode

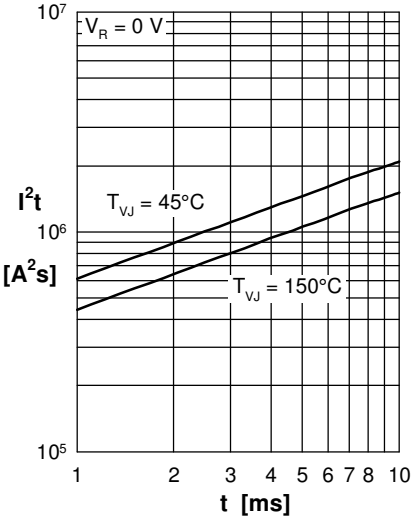

Fig. 3 I^2t versus time per diode

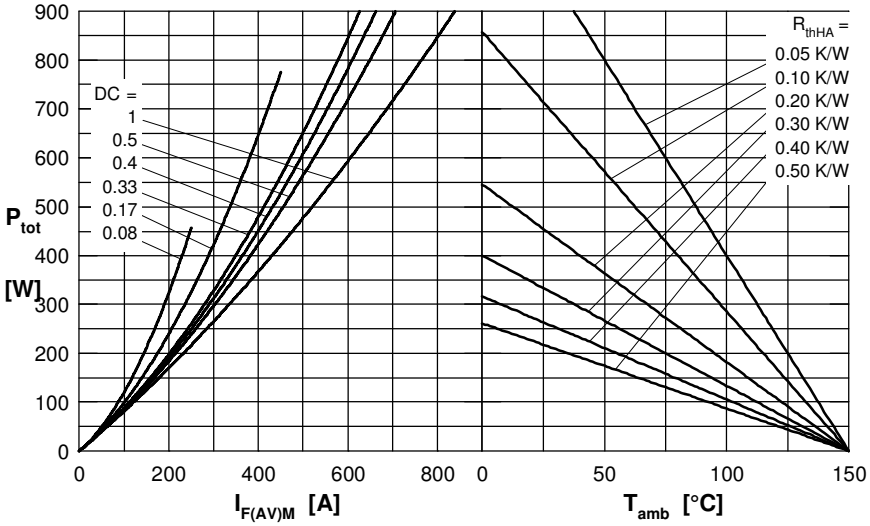

Fig. 4 Power dissipation vs. forward current and ambient temperature per diode

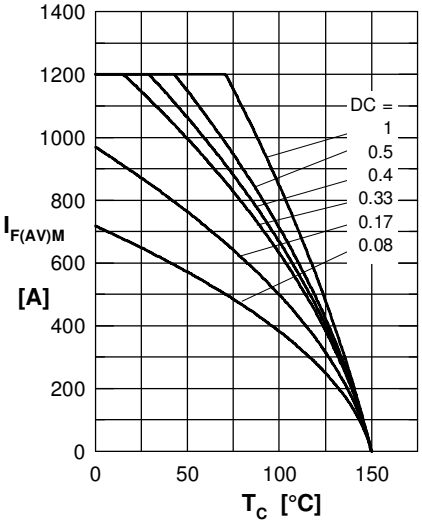

Fig. 5 Max. forward current vs. case temperature per diode

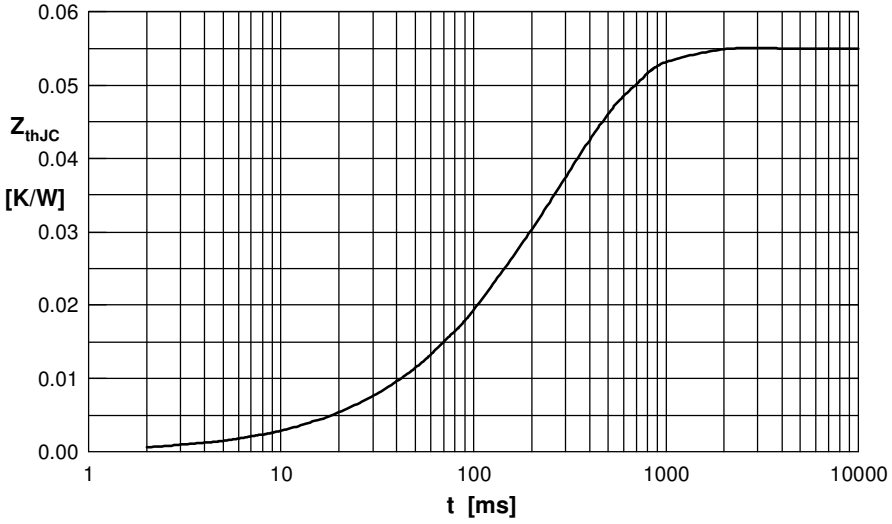

Fig. 6 Transient thermal impedance junction to case vs. time per diode

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.001	0.0150
2	0.004	0.0600
3	0.017	0.2000
4	0.033	0.3400

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