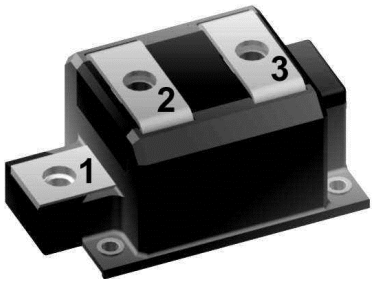
High Voltage Standard Rectifier Module

V_{RRM} = 2x 2200 V
I_{FAV} = 700 A
V_F = 1.05 V

Phase leg

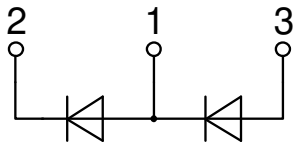
Part number

MDNA700P2200CC



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

Disclaimer Notice

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Rectifier

Symbol	Definition	Conditions		Ratings min.	typ.	max.	Unit
V_{RSM}	*max. non-repetitive reverse blocking voltage*		T_{VJ} = 25°C			2300	V
V_{RRM}	*max. repetitive reverse blocking voltage*		T_{VJ} = 25°C			2200	V
I_R	*reverse current*	V_R = 2200 V	T_{VJ} = 25°C			500	µA
		V_R = 2200 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	MA²s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			1.94	MA²s
		t = 10 ms; (50 Hz), sine	T_{VJ} = 150°C			1.45	MA²s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			1.40	MA²s
C_J	*junction capacitance*	V_R = 400 V; f = 1 MHz	T_{VJ} = 25°C		781		pF

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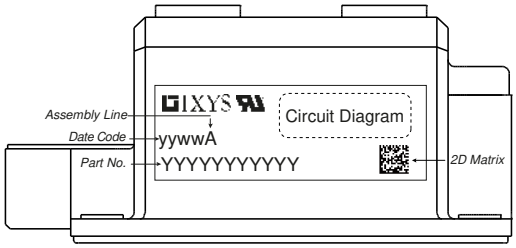
Package ComPack				Ratings			
Symbol	**Definition**	**Conditions**		**min.**	**typ.**	**max.**	**Unit**
I_{RMS}	*RMS current*	per terminal				1200	A
T_{VJ}	*virtual junction temperature*			-40		150	°C
T_{op}	*operation temperature*			-40		125	°C
T_{stg}	*storage temperature*			-40		125	°C
Weight					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



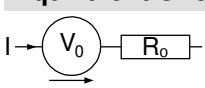
Part description

M = Module
D = Diode
N = High Voltage Standard Rectifier
A = (>= 2000V)
700 = Current Rating [A]
P = Phase leg
2200 = Reverse Voltage [V]
CC = ComPack

Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	MDNA700P2200CC	MDNA700P2200CC	Box	3	526027

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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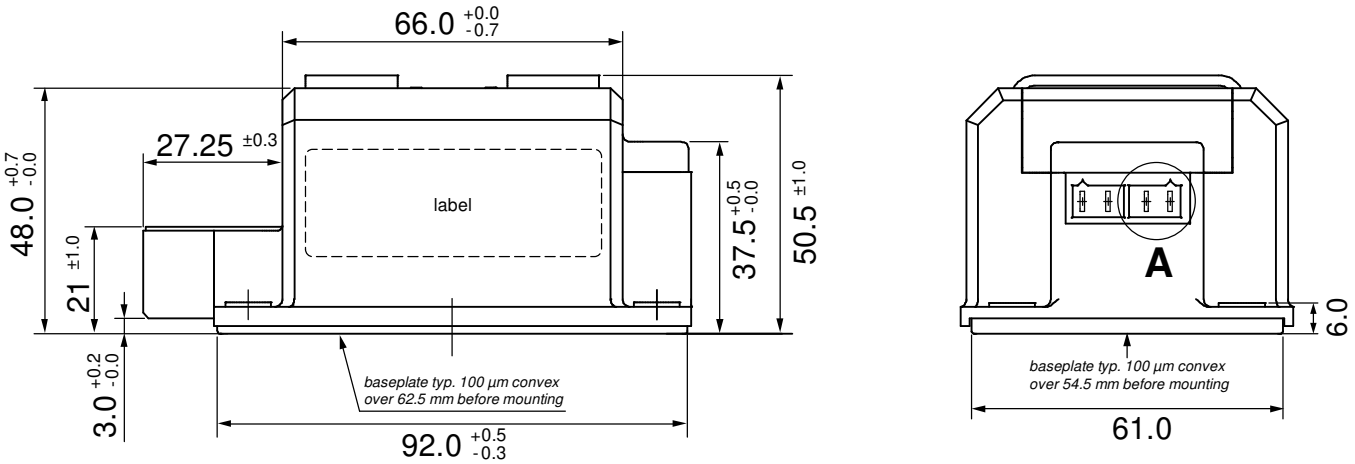
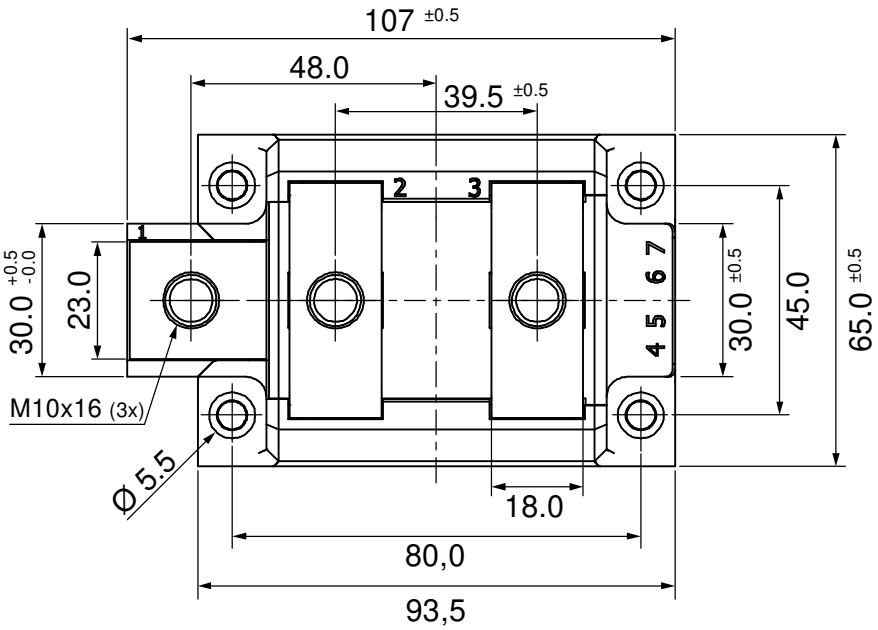
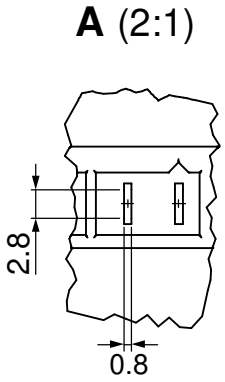
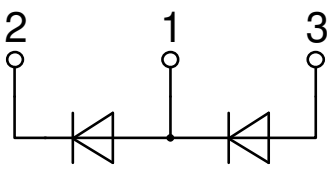
Outlines ComPack









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Rectifier

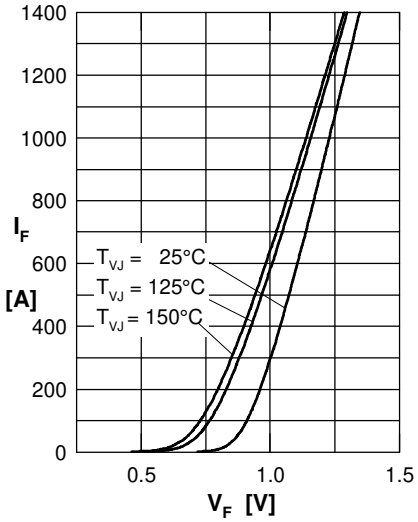

Fig. 1 Forward current versus voltage drop per diode

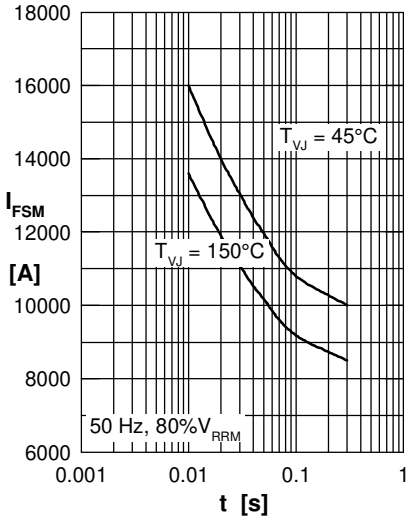

Fig. 2 Surge overload current vs. time per diode

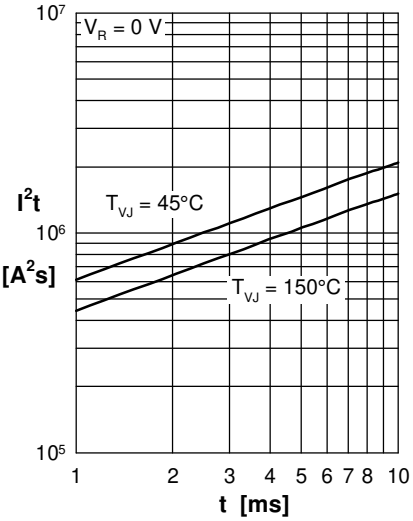

Fig. 3 I^2t versus time per diode

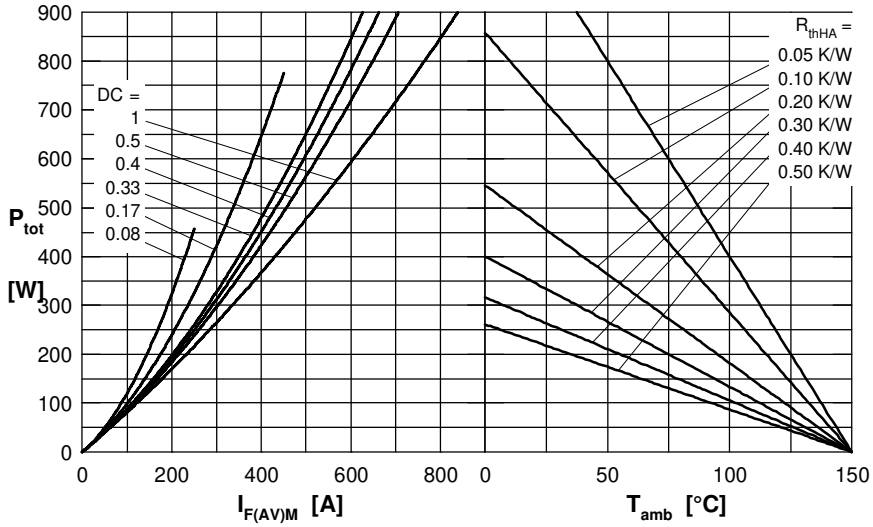

Fig. 4 Power dissipation vs. forward current and ambient temperature per diode

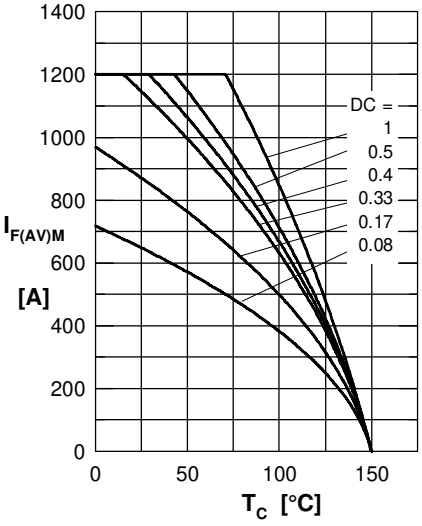

Fig. 5 Max. forward current vs. case temperature per diode

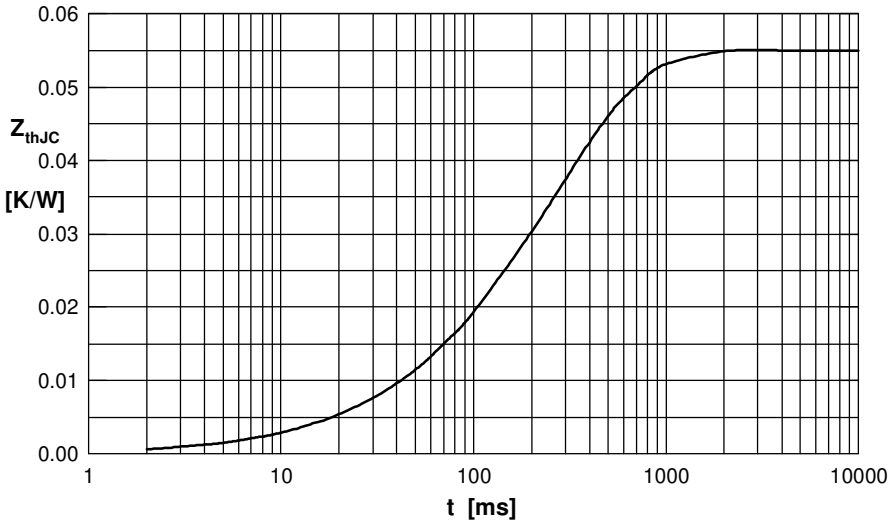

Fig. 6 Transient thermal impedance junction to case vs. time per diode

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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