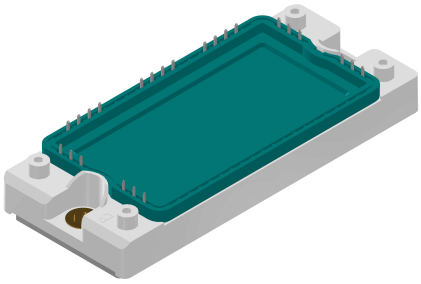
High Voltage Standard Rectifier Module

3~ Rectifier		
V_{RRM}	=	2200 V
I_{DAV}	=	240 A
I_{FSM}	=	1500 A

3~ Rectifier Bridge

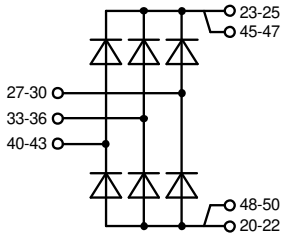
Part number

MDNA240U2200ED



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

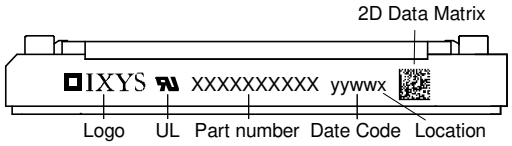
Package: E2-Pack

- Isolation Voltage: 4300 V~
- Industry standard outline
- RoHS compliant
- Height: 30 mm
- Base plate: DCB ceramic
- Reduced weight
- Advanced power cycling

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			200	µA
		V_R = 2200 V	T_{VJ} = 150°C			2	mA
V_F	*forward voltage drop*	I_F = 80 A	T_{VJ} = 25°C			1.27	V
		I_F = 240 A				1.90	V
		I_F = 80 A	T_{VJ} = 125°C			1.22	V
		I_F = 240 A				2.00	V
I_{DAV}	*bridge output current*	T_C = 90°C	T_{VJ} = 150°C			240	A
		rectangular d = 120°					
V_{F0}	*threshold voltage* } *for power loss calculation only*		T_{VJ} = 150°C			0.79	V
r_F	*slope resistance* }					5.1	mΩ
R_{thJC}	*thermal resistance junction to case*					0.35	K/W
R_{thCH}	*thermal resistance case to heatsink*				0.10		K/W
P_{tot}	*total power dissipation*		T_C = 25°C			355	W
I_{FSM}	*max. forward surge current*	t = 10 ms; (50 Hz), sine	T_{VJ} = 45°C			1.50	kA
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			1.62	kA
		t = 10 ms; (50 Hz), sine	T_{VJ} = 150°C			1.28	kA
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			1.38	kA
I^2t	*value for fusing*	t = 10 ms; (50 Hz), sine	T_{VJ} = 45°C			11.3	kA²s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			10.9	kA²s
		t = 10 ms; (50 Hz), sine	T_{VJ} = 150°C			8.13	kA²s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			7.87	kA²s
C_J	*junction capacitance*	V_R = 700 V; f = 1 MHz	T_{VJ} = 25°C		40		pF

Package E2-Pack				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					176		g
M_D	*mounting torque*			3		6	Nm
$d_{Spp/App}$	*creepage distance on surface | striking distance through air*		*terminal to terminal*	6.0			mm
$d_{Spb/Apb}$			*terminal to backside*	12.0			mm
V_{ISOL}	*isolation voltage*	t = 1 second	50/60 Hz, RMS; I_{ISOL} ≤ 1 mA	4300			V
		t = 1 minute		3600			V



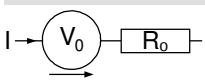
Part description

M = Module
D = Diode
N = High Voltage Standard Rectifier
A = (>= 2000V)
240 = Current Rating [A]
U = 3~ Rectifier Bridge
2200 = Reverse Voltage [V]
ED = E2-Pack

Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	MDNA240U2200ED	MDNA240U2200ED	Box	6	514878

Equivalent Circuits for Simulation

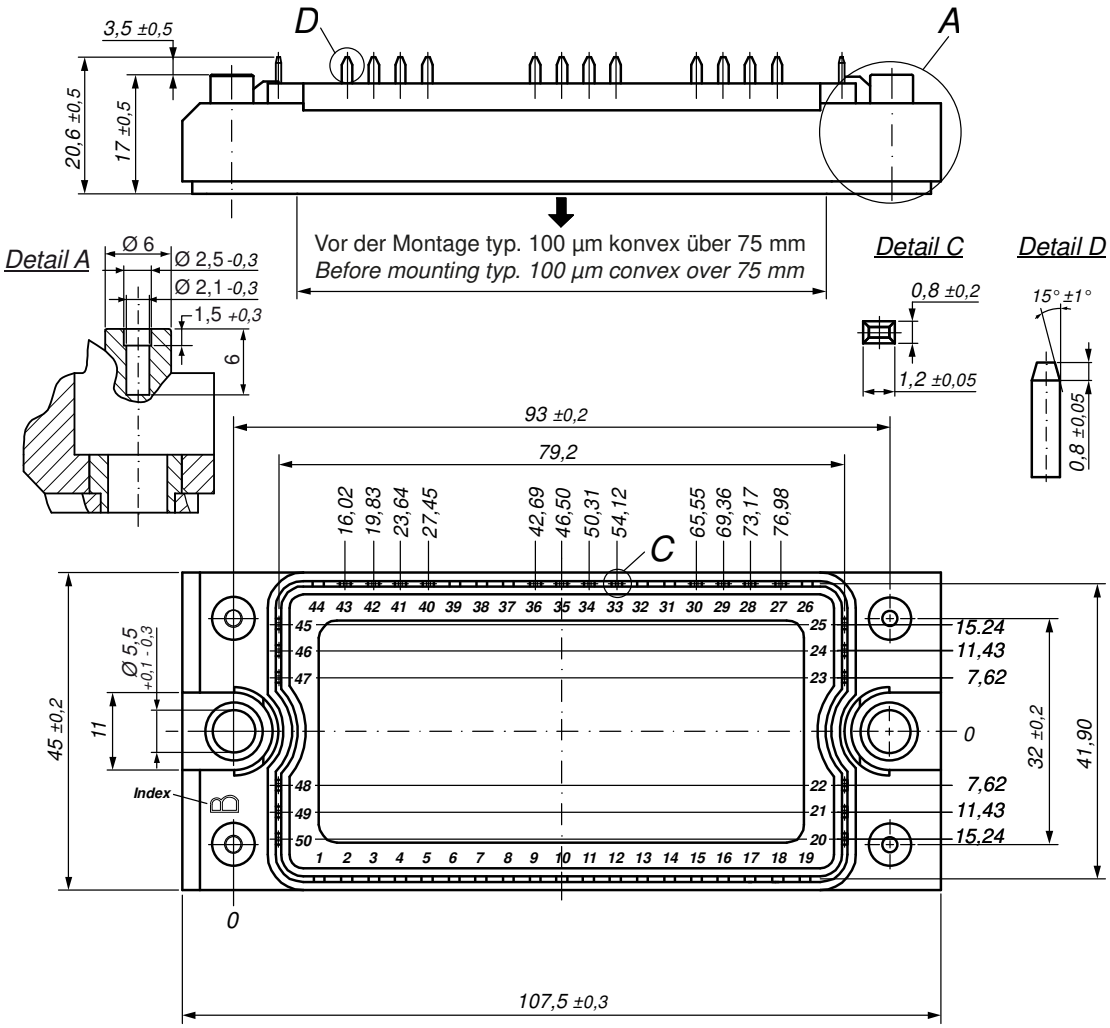
** on die level* T_{VJ} = 150 °C



Rectifier

$V_{0\,max}$	*threshold voltage*	0.79	V
$R_{0\,max}$	*slope resistance **	2	mΩ

Outlines E2-Pack

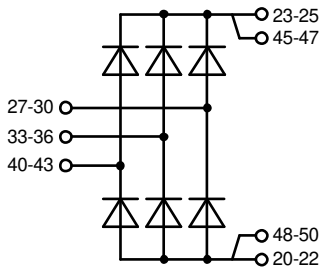


Bemerkung / ***Note:***

- Nichttolerierte Maße nach / *Measure without tolerances according DIN ISO 2768-T1-m*
- PCB-Lochmuster / *PCB hole pattern:* **see pin position**
- Toleranz Pin-Position und PCB-Lochmuster / *Tolerance of pin position and PCB hole pattern:* ⌖ **0.1**
- Montageanleitung / *Mounting instruction:* www.ixys.com **Application note IXAN0024**

***Detail A*:** PCB-Montage / *Mounting on PCB*

- Empfohlene, selbstschneidende Schraube / *Recommended, self-tapping screw:* **EJOT PT®** (Größe / *size:* **K25**)
- Max. Schraubenlänge / *Max. screw length:* **PCB-Dicke** / **thickness + 6 mm** *(*max. Lochtiefe / *hole depth)*
- Empfohlenes Drehmoment / *Recommended mounting torque:* **1.5 Nm**



Rectifier

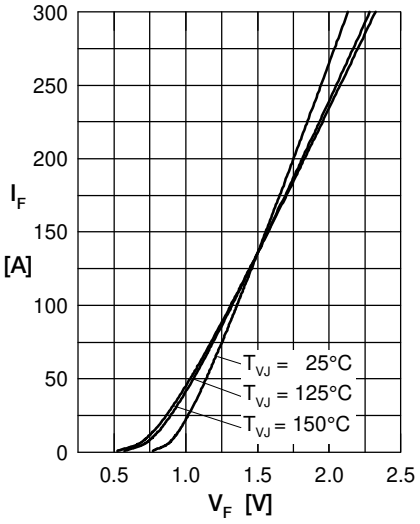


Fig. 1 Forward current versus voltage drop per diode

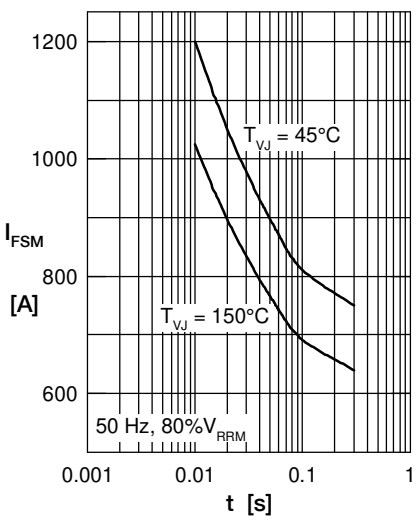


Fig. 2 Surge overload current

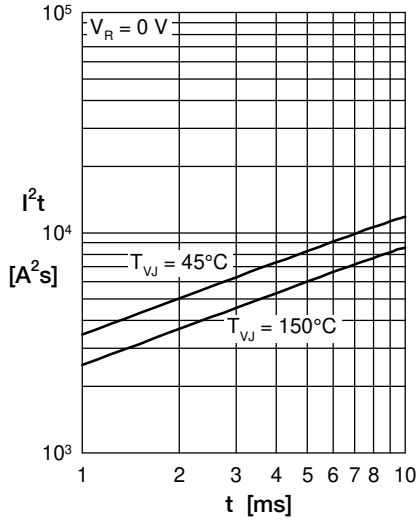


Fig. 3 I^2t versus time per diode

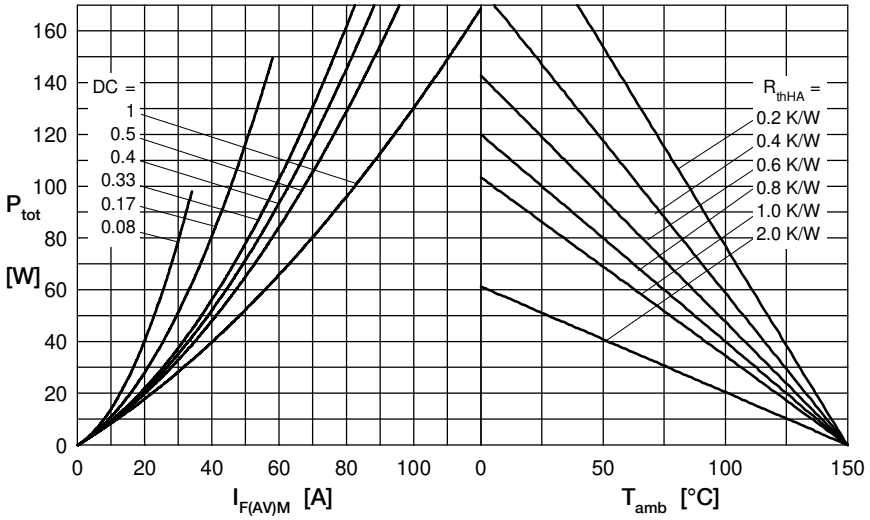


Fig. 4 Power dissipation vs. direct output current and ambient temperature

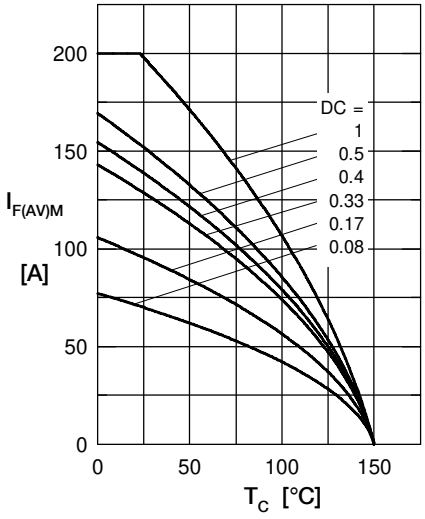


Fig. 5 Max. forward current vs. case temperature

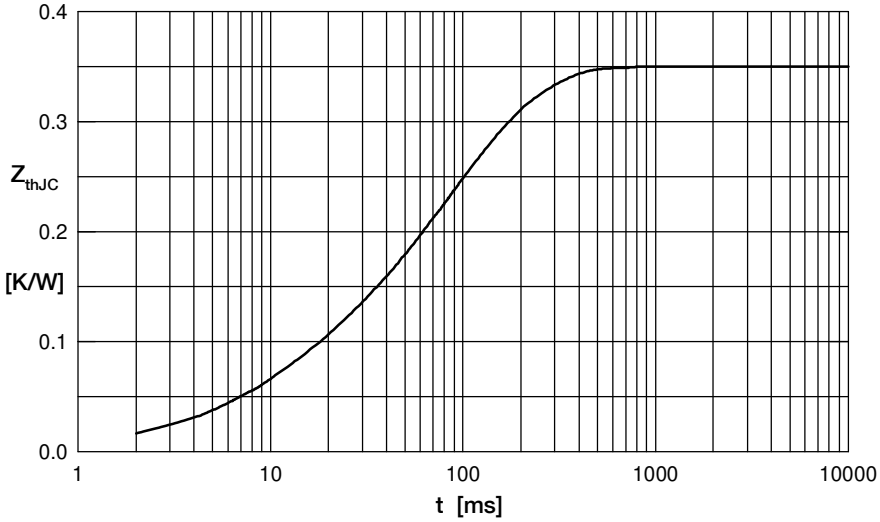


Fig. 6 Transient thermal impedance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.05	0.01
2	0.003	0.007
3	0.09	0.055
4	0.157	0.12
5	0.05	0.1

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Authorized Distributor

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