

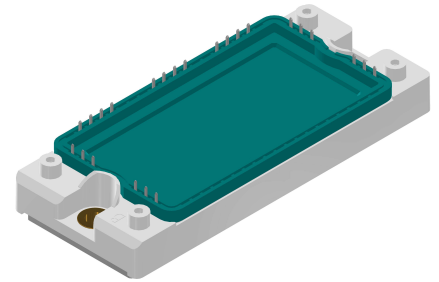
High Voltage Standard Rectifier Module

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

3~ Rectifier Bridge

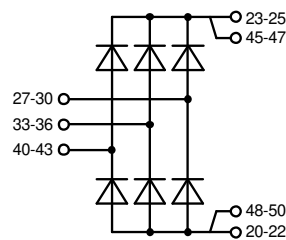
Part number

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

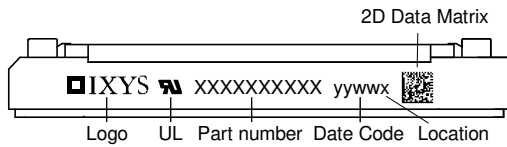
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Rectifier				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
V_{RSM}	max. non-repetitive reverse blocking voltage					2300	V
V_{RRM}	max. repetitive reverse blocking voltage					2200	V
I_R	reverse current	$V_R = 2200$ V		$T_{VJ} = 25^\circ\text{C}$		200	μA
		$V_R = 2200$ V		$T_{VJ} = 150^\circ\text{C}$		2	mA
V_F	forward voltage drop	$I_F = 80$ A		$T_{VJ} = 25^\circ\text{C}$		1.27	V
		$I_F = 240$ A				1.90	V
		$I_F = 80$ A		$T_{VJ} = 125^\circ\text{C}$		1.22	V
		$I_F = 240$ A				2.00	V
I_{DAV}	bridge output current	$T_C = 90^\circ\text{C}$		$T_{VJ} = 150^\circ\text{C}$		240	A
		rectangular	$d = 120^\circ$				
V_{FO}	threshold voltage	} for power loss calculation only				0.79	V
r_F	slope resistance					5.1	m Ω
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			$T_C = 25^\circ\text{C}$		355	W
I_{FSM}	max. forward surge current	$t = 10$ ms; (50 Hz), sine		$T_{VJ} = 45^\circ\text{C}$		1.50	kA
		$t = 8,3$ ms; (60 Hz), sine		$V_R = 0$ V		1.62	kA
		$t = 10$ ms; (50 Hz), sine		$T_{VJ} = 150^\circ\text{C}$		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		$T_{VJ} = 45^\circ\text{C}$		11.3	kA ² s
		$t = 8,3$ ms; (60 Hz), sine		$V_R = 0$ V		10.9	kA ² s
		$t = 10$ ms; (50 Hz), sine		$T_{VJ} = 150^\circ\text{C}$		8.13	kA ² s
		$t = 8,3$ ms; (60 Hz), sine		$V_R = 0$ V		7.87	kA ² s
C_J	junction capacitance	$V_R = 700$ V; $f = 1$ MHz		$T_{VJ} = 25^\circ\text{C}$		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; $I_{ISOL} \leq 1$ mA	4300			V
		t = 1 minute	3600			V



Part description

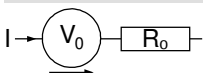
- M = Module
- D = Diode
- N = High Voltage Standard Rectifier
- A = (>= 2000V)
- 240 = Current Rating [A]
- U = 3- Rectifier Bridge
- 2200 = Reverse Voltage [V]
- ED = E2-Pack

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

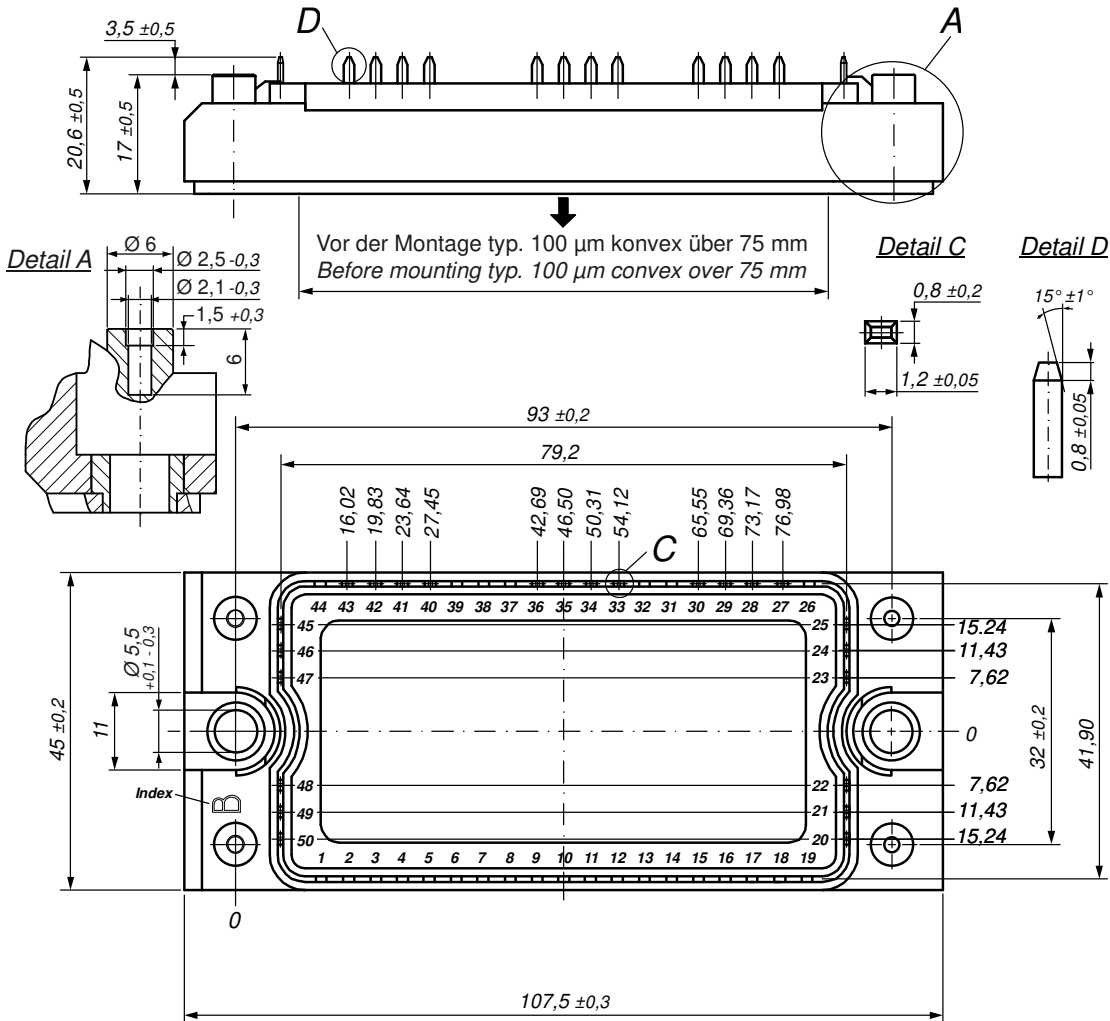


Rectifier

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



Outlines E2-Pack

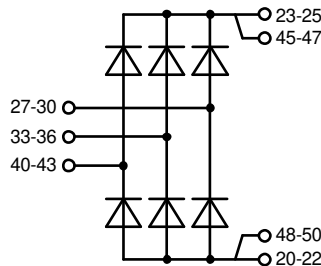


Bemerkung / Note:

- Nichttolerierete 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: $\oplus 0.1$
- Montageanleitung / Mounting instruction: www.ixys.com **Application note IXAN0024**

Detail A: PCB-Montage / Mounting on PCB ^L

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





Rectifier

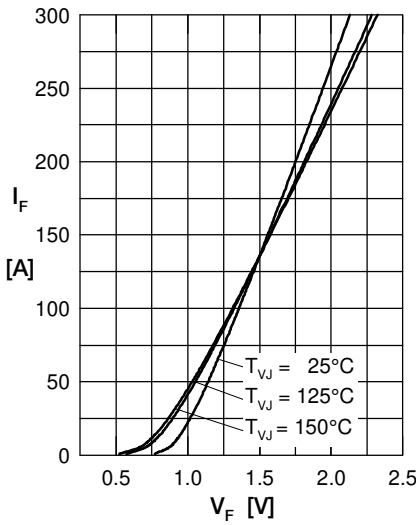


Fig. 1 Forward current versus voltage drop per diode

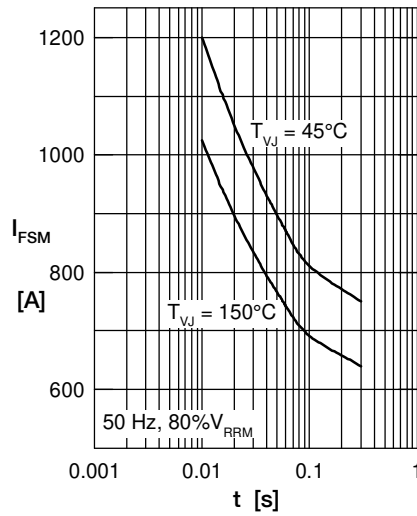


Fig. 2 Surge overload current

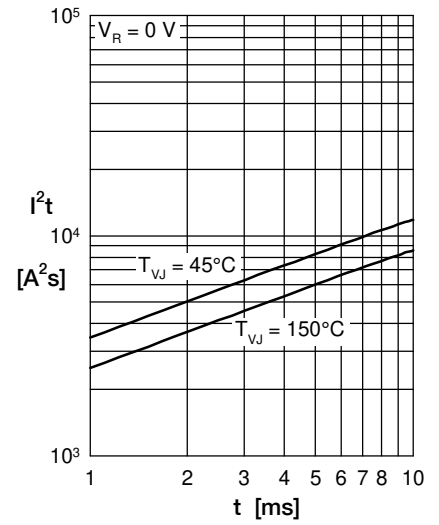


Fig. 3 I^2t versus time per diode

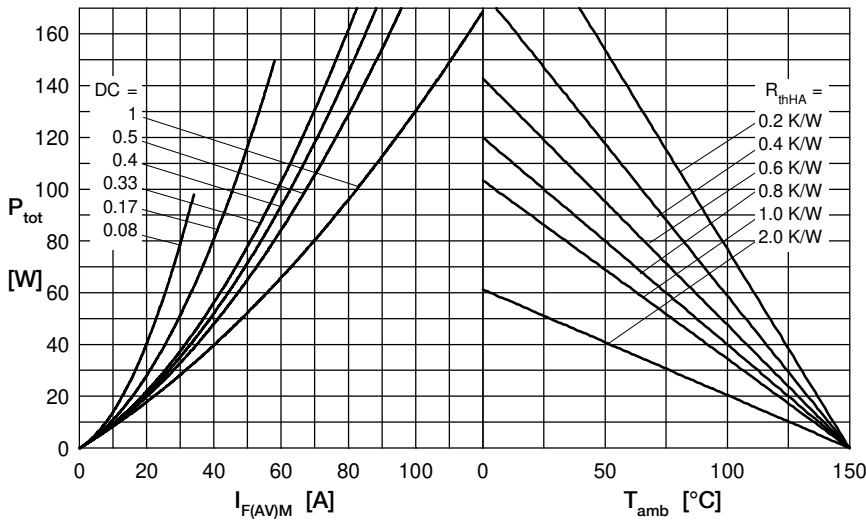


Fig. 4 Power dissipation vs. direct output current and ambient temperature

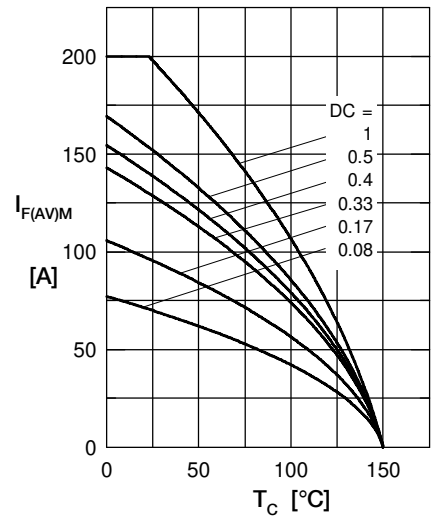


Fig. 5 Max. forward current vs. case temperature

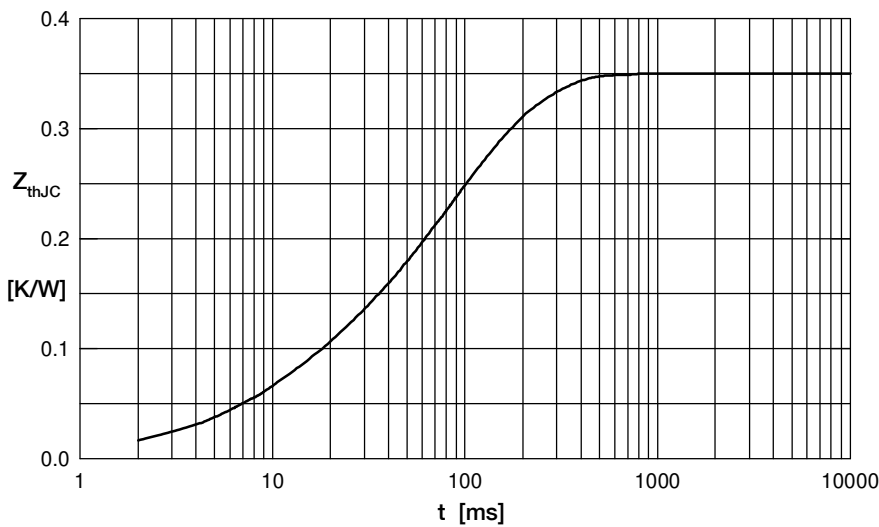


Fig. 6 Transient thermal impedance junction to case

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