

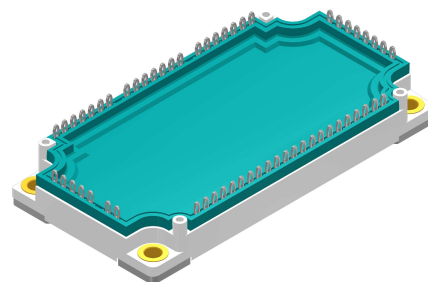
Standard Rectifier Module

3~ Rectifier
$V_{RRM} = 1600 \text{ V}$
$I_{DAV} = 660 \text{ A}$
$I_{FSM} = 5000 \text{ A}$

3~ Rectifier Bridge + NTC

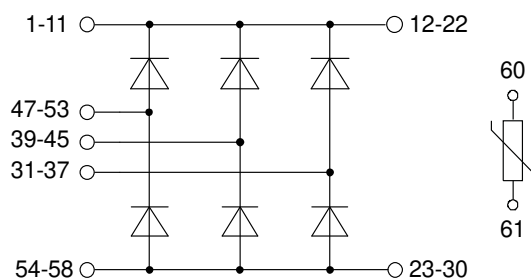
Part number

MDMA660U1600PTEH



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 three phase bridge configurations
- Supplies for DC power equipment
- Input rectifiers for PWM inverter
- Battery DC power supplies
- Field supply for DC motors

Package: E3-Pack

- Isolation Voltage: 4300 V~
- Industry standard outline
- RoHS compliant
- PressFit-Pins for PCB mounting
- Height: 17 mm
- Base plate: Copper internally DCB isolated
- Advanced power cycling
- Phase Change Material available

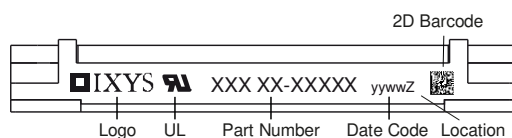
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Rectifier				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
V_{RSM}	max. non-repetitive reverse blocking voltage	$T_{VJ} = 25^{\circ}\text{C}$				1700	V
V_{RRM}	max. repetitive reverse blocking voltage	$T_{VJ} = 25^{\circ}\text{C}$				1600	V
I_R	reverse current	$V_R = 1600\text{ V}$	$T_{VJ} = 25^{\circ}\text{C}$			200	μA
		$V_R = 1600\text{ V}$	$T_{VJ} = 150^{\circ}\text{C}$			3	mA
V_F	forward voltage drop	$I_F = 220\text{ A}$	$T_{VJ} = 25^{\circ}\text{C}$			1.28	V
		$I_F = 660\text{ A}$				1.95	V
		$I_F = 220\text{ A}$	$T_{VJ} = 125^{\circ}\text{C}$			1.19	V
		$I_F = 660\text{ A}$				1.95	V
I_{DAV}	bridge output current	$T_C = 85^{\circ}\text{C}$	$T_{VJ} = 150^{\circ}\text{C}$			660	A
		rectangular $d = \frac{1}{3}$					
V_{F0}	threshold voltage	} for power loss calculation only		$T_{VJ} = 150^{\circ}\text{C}$		0.77	V
r_F	slope resistance					1.8	m Ω
R_{thJC}	thermal resistance junction to case					0.15	K/W
R_{thCH}	thermal resistance case to heatsink				0.075		K/W
P_{tot}	total power dissipation	$T_C = 25^{\circ}\text{C}$				830	W
I_{FSM}	max. forward surge current	$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}$	$T_{VJ} = 45^{\circ}\text{C}$			5.00	kA
		$t = 8,3\text{ ms}; (60\text{ Hz}), \text{ sine}$	$V_R = 0\text{ V}$			5.40	kA
		$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}$	$T_{VJ} = 150^{\circ}\text{C}$			4.25	kA
		$t = 8,3\text{ ms}; (60\text{ Hz}), \text{ sine}$	$V_R = 0\text{ V}$			4.59	kA
I^2t	value for fusing	$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}$	$T_{VJ} = 45^{\circ}\text{C}$			125.0	kA ² s
		$t = 8,3\text{ ms}; (60\text{ Hz}), \text{ sine}$	$V_R = 0\text{ V}$			121.3	kA ² s
		$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}$	$T_{VJ} = 150^{\circ}\text{C}$			90.3	kA ² s
		$t = 8,3\text{ ms}; (60\text{ Hz}), \text{ sine}$	$V_R = 0\text{ V}$			87.6	kA ² s
C_J	junction capacitance	$V_R = 400\text{ V}; f = 1\text{ MHz}$			208		pF

Package E3-Pack				Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit	
I _{RMS}	RMS current	per terminal			30	A	
T _{VJ}	virtual junction temperature		-40		175	°C	
T _{op}	operation temperature		-40		150	°C	
T _{stg}	storage temperature		-40		125	°C	
Weight				270		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	4300			V	
		t = 1 minute	3600			V	
		50/60 Hz, RMS; I _{ISOL} ≤ 1 mA					



Part description

M = Module
 D = Diode
 M = Standard Rectifier
 A = (up to 1800V)
 660 = Current Rating [A]
 U = 3- Rectifier Bridge
 1600 = Reverse Voltage [V]
 PT = PressFit-Pin, Thermistor
 EH = E3-Pack
 - = Hyphen
 PC = Phase Change Material

Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	MDMA660U1600PTEH	MDMA660U1600PTEH	Blister	24	515654
Alternative	MDMA660U1600PTEH-PC	MDMA660U1600PTEH	Blister	24	514475

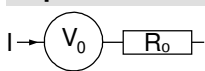
Temperature Sensor NTC

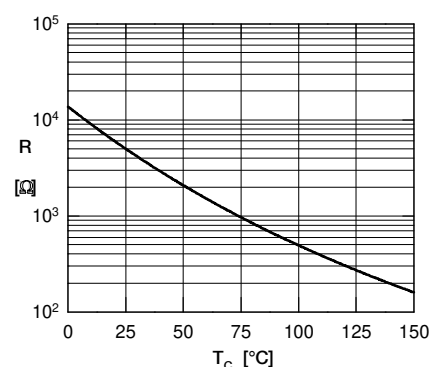
Symbol	Definition	Conditions	min.	typ.	max.	Unit
R_{25}	resistance	$T_{VJ} = 25^\circ$	4.85	5	5.15	kΩ
$B_{25/50}$	temperature coefficient			3375		K

Equivalent Circuits for Simulation

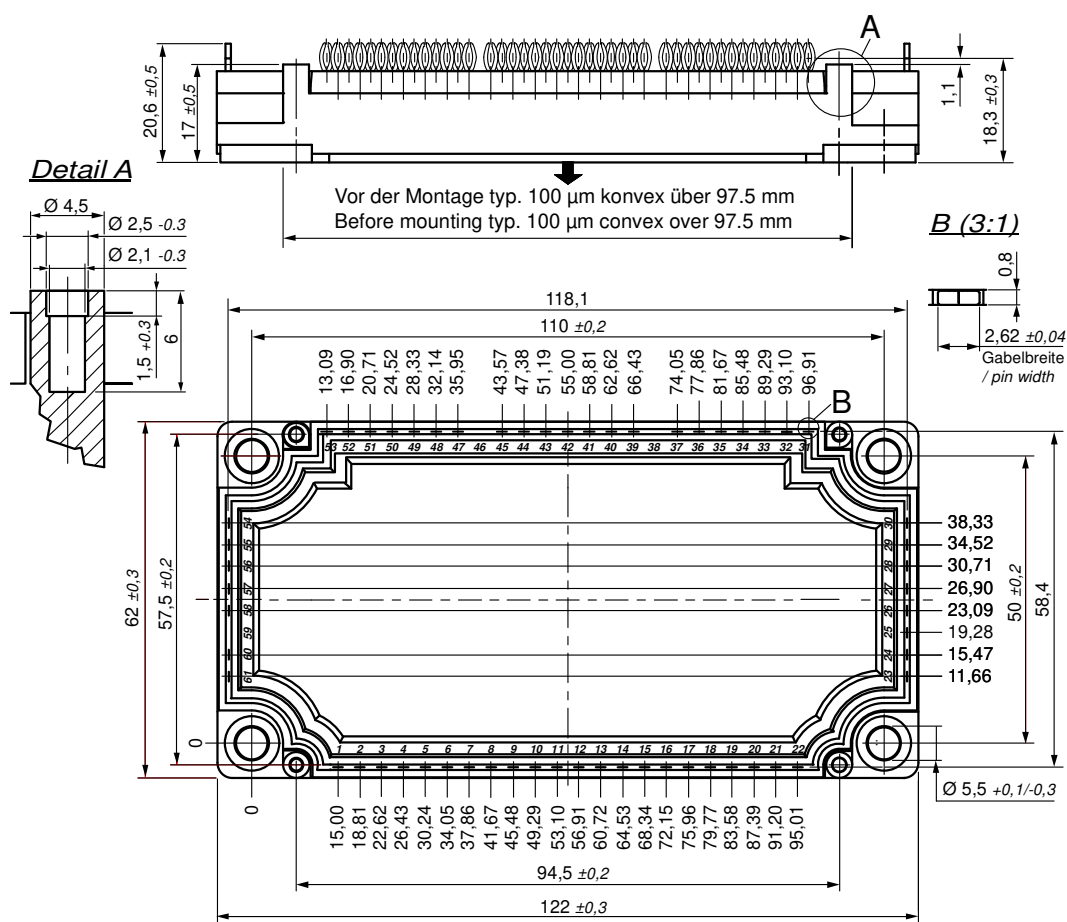
* on die level

$T_{VJ} = 150^\circ\text{C}$

			Rectifier
$V_{0\max}$	threshold voltage	0.77	V
$R_{0\max}$	slope resistance *	0.57	mΩ



Outlines E3-Pack

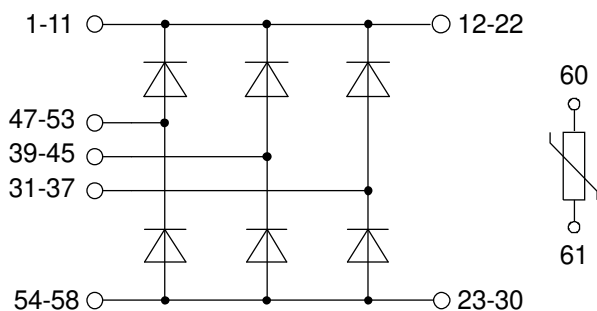


Bemerkung / Note:

- 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**
 - Bohrlochdurchmesser / *Diameter of drill: Ø 2.35 mm*
 - Endlochdurchmesser / *Diameter of plated holes: Ø 2.14 - 2.29 mm* (Cu thickness in via typ. 50 µm)
 - Beschichtung / *Plating: chem. Sn max. 15 µm*
 - Einpresskraft / *Insert Force:* per terminal with a typ. insert speed of 7 mm/s: **typ. 90 N**
 - Weitere Angaben / *Further information:* www.ixys.com **Application note IXAN0077**
 - 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**



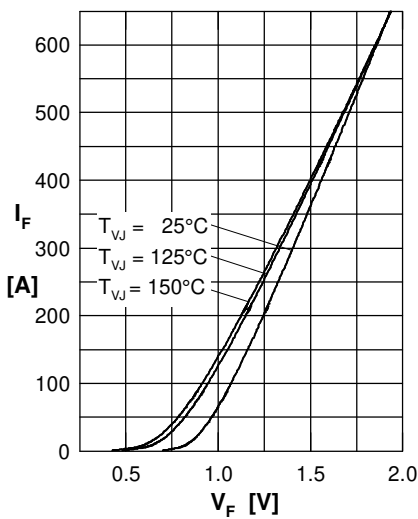
Rectifier


Fig. 1 Forward current versus voltage drop per diode

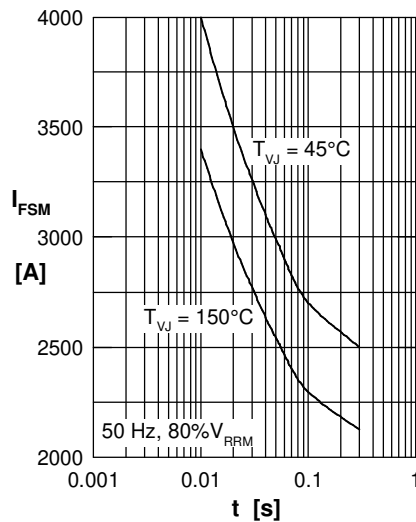


Fig. 2 Surge overload current vs. time per diode

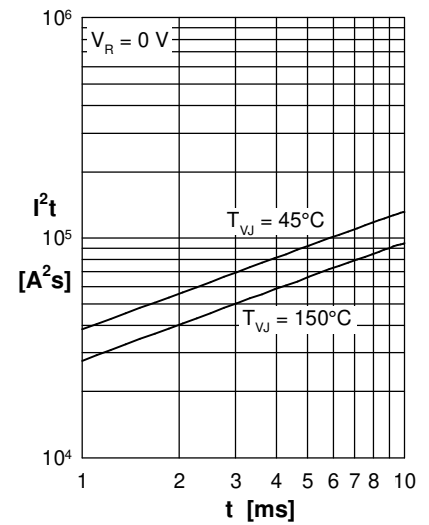
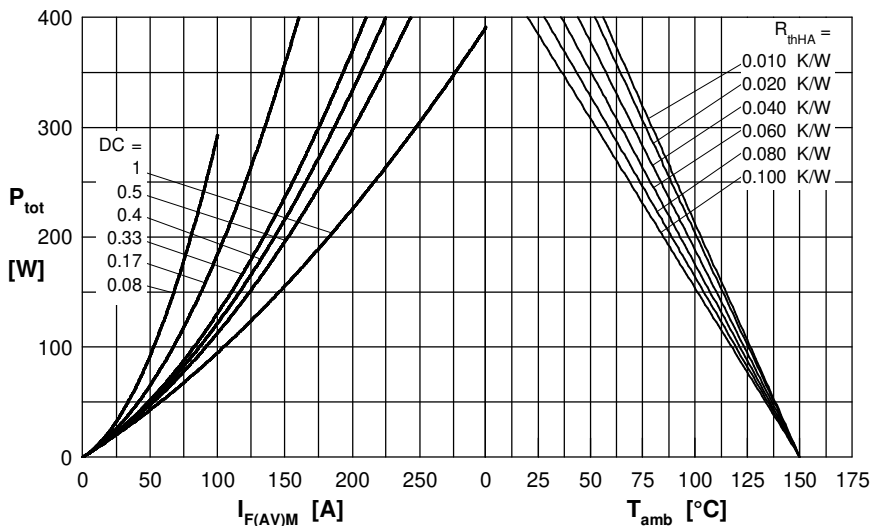

 Fig. 3 I^2t versus time per diode


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

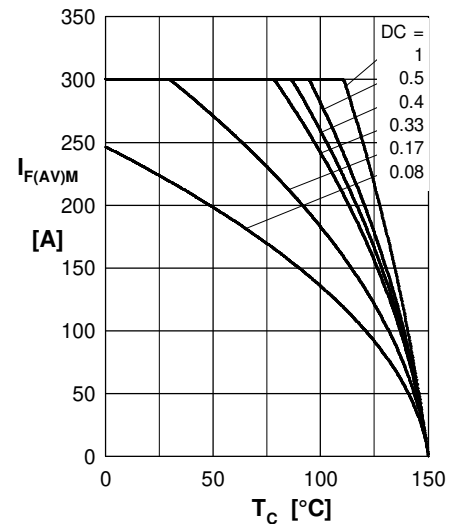


Fig. 5 Max. forward current vs. case temperature per diode

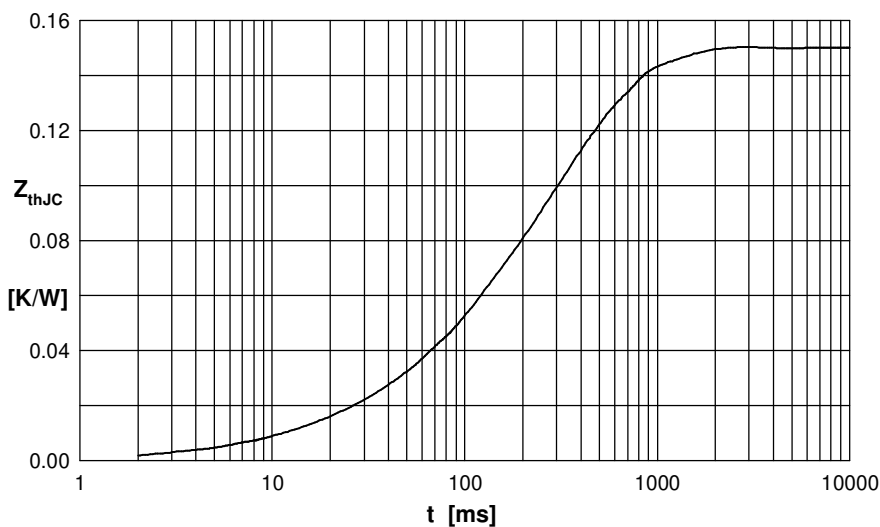


Fig. 6 Transient thermal impedance junction to case vs. time per diode

 Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.006	0.015
2	0.017	0.080
3	0.039	0.220
4	0.088	0.380