

# Standard Rectifier Module

$V_{RRM} = 2 \times 1400 \text{ V}$

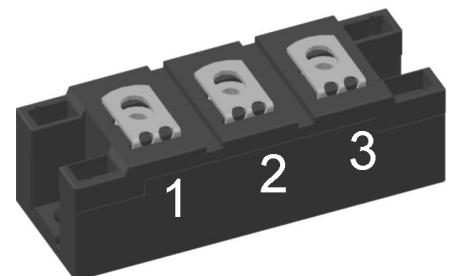
$I_{FAV} = 224 \text{ A}$

$V_F = 1.07 \text{ V}$

## Phase leg

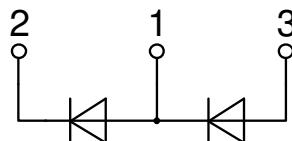
### Part number

**MDD200-14N1**



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: Y4

- Isolation Voltage: 3600 V~
- Industry standard outline
- RoHS compliant
- Height: 30 mm
- Base plate: DCB ceramic
- Reduced weight
- Advanced power cycling

### Terms .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.

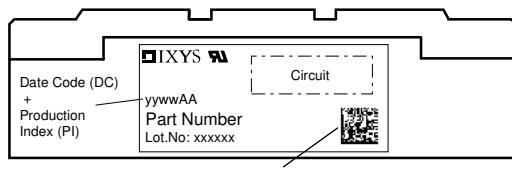
Due to technical requirements our product may contain dangerous substances. For information on the types in question please contact your local sales office. Should you intend to use the product in aviation, in health or life endangering or life support applications, please notify. For any such application 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.

## Rectifier

Symbol	Definition	Conditions	Ratings			
			min.	typ.	max.	
$V_{RSM}$	max. non-repetitive reverse blocking voltage	$T_{VJ} = 25^\circ\text{C}$			1500	V
$V_{RRM}$	max. repetitive reverse blocking voltage	$T_{VJ} = 25^\circ\text{C}$			1400	V
$I_R$	reverse current	$V_R = 1400 \text{ V}$ $V_R = 1400 \text{ V}$	$T_{VJ} = 25^\circ\text{C}$ $T_{VJ} = 150^\circ\text{C}$		1 20	mA
$V_F$	forward voltage drop	$I_F = 300 \text{ A}$ $I_F = 600 \text{ A}$ $I_F = 300 \text{ A}$ $I_F = 600 \text{ A}$	$T_{VJ} = 25^\circ\text{C}$ $T_{VJ} = 125^\circ\text{C}$		1.16 1.39 1.07 1.36	V
$I_{FAV}$	average forward current	$T_C = 100^\circ\text{C}$	$T_{VJ} = 150^\circ\text{C}$		224	A
$I_{F(RMS)}$	RMS forward current	180° sine	$d = 0.5$		350	A
$V_{F0}$ $r_F$	threshold voltage slope resistance	} for power loss calculation only		$T_{VJ} = 150^\circ\text{C}$	0.80 0.6	V mΩ
$R_{thJC}$	thermal resistance junction to case				0.13	K/W
$R_{thCH}$	thermal resistance case to heatsink			0.08		K/W
$P_{tot}$	total power dissipation		$T_C = 25^\circ\text{C}$		960	W
$I_{FSM}$	max. forward surge current	$t = 10 \text{ ms}; (50 \text{ Hz}), \text{sine}$ $t = 8,3 \text{ ms}; (60 \text{ Hz}), \text{sine}$	$T_{VJ} = 45^\circ\text{C}$ $V_R = 0 \text{ V}$		10.5 11.3	kA
		$t = 10 \text{ ms}; (50 \text{ Hz}), \text{sine}$ $t = 8,3 \text{ ms}; (60 \text{ Hz}), \text{sine}$	$T_{VJ} = 150^\circ\text{C}$ $V_R = 0 \text{ V}$		8.93 9.64	kA
$I^2t$	value for fusing	$t = 10 \text{ ms}; (50 \text{ Hz}), \text{sine}$ $t = 8,3 \text{ ms}; (60 \text{ Hz}), \text{sine}$	$T_{VJ} = 45^\circ\text{C}$ $V_R = 0 \text{ V}$		551.3 535.0	kA²s
		$t = 10 \text{ ms}; (50 \text{ Hz}), \text{sine}$ $t = 8,3 \text{ ms}; (60 \text{ Hz}), \text{sine}$	$T_{VJ} = 150^\circ\text{C}$ $V_R = 0 \text{ V}$		398.3 386.6	kA²s
$C_J$	junction capacitance	$V_R = 1100 \text{ V}; f = 1 \text{ MHz}$	$T_{VJ} = 25^\circ\text{C}$	230		pF

Package Y4			Ratings		
Symbol	Definition	Conditions	min.	typ.	max.
					Unit
$I_{RMS}$	<i>RMS current</i>	per terminal			300 A
$T_{VJ}$	<i>virtual junction temperature</i>		-40		150 °C
$T_{op}$	<i>operation temperature</i>		-40		125 °C
$T_{stg}$	<i>storage temperature</i>		-40		125 °C
<b>Weight</b>				150	g
$M_D$	<i>mounting torque</i>		2.25		2.75 Nm
$M_T$	<i>terminal torque</i>		4.5		5.5 Nm
$d_{Spp/App}$	<i>creepage distance on surface / striking distance through air</i>		<i>terminal to terminal</i>	14.0	10.0 mm
$d_{Spb/Abp}$			<i>terminal to backside</i>	16.0	16.0 mm
$V_{ISOL}$	<i>isolation voltage</i>	$t = 1$ second $t = 1$ minute 50/60 Hz, RMS; $I_{ISOL} \leq 1$ mA		3600 3000	V V



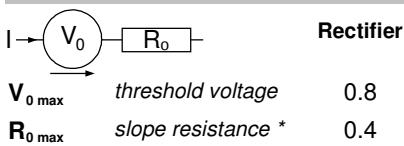
Data Matrix: part no. (1-19), DC + PI (20-25), lot.no.# (26-31), blank (32), serial no.# (33-36)

Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	MDD200-14N1	MDD200-14N1	Box	6	500215

### Equivalent Circuits for Simulation

\* on die level

$T_{VJ} = 150$  °C



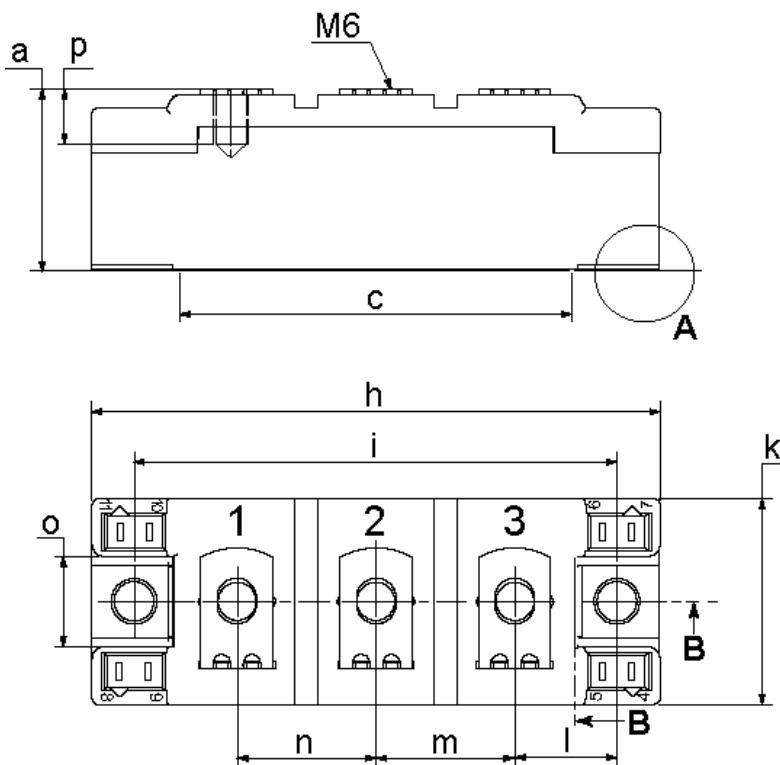
$V_{0\ max}$  threshold voltage 0.8

V

$R_{0\ max}$  slope resistance \* 0.4

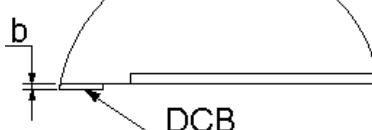
$m\Omega$

## Outlines Y4

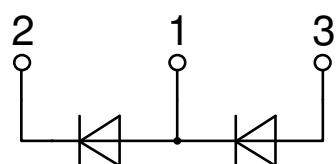
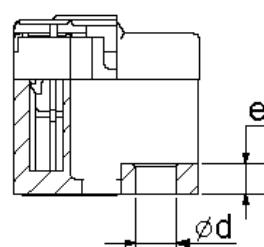


Dim.	MIN [mm]	MAX [mm]	MIN [inch]	MAX [inch]
a	30.0	30.6	1.181	1.205
b	typ. 0.25		typ. 0.010	
c	64.0	65.0	2.520	2.559
d	6.5	7.0	0.256	0.275
e	4.9	5.1	0.193	0.201
h	93.5	94.5	3.681	3.720
i	79.5	80.5	3.130	3.169
k	33.4	34.0	1.315	1.339
l	16.7	17.3	0.657	0.681
m	22.7	23.3	0.894	0.917
n	22.7	23.3	0.894	0.917
o	14.0	15.0	0.551	0.591
p	typ. 10.5		typ. 0.413	

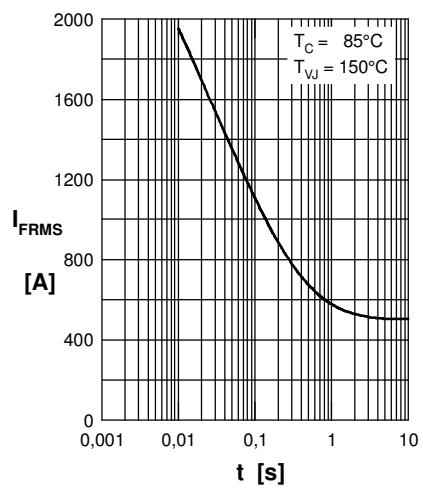
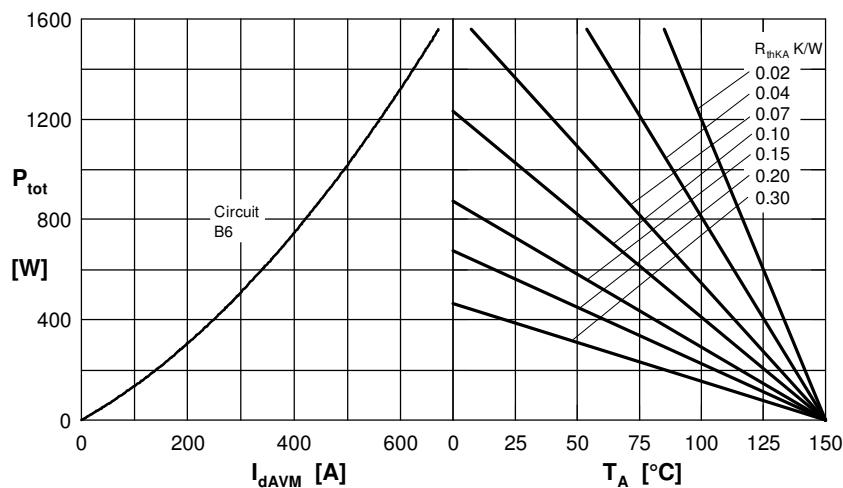
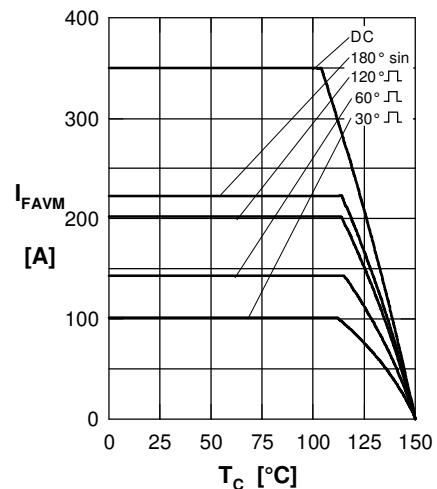
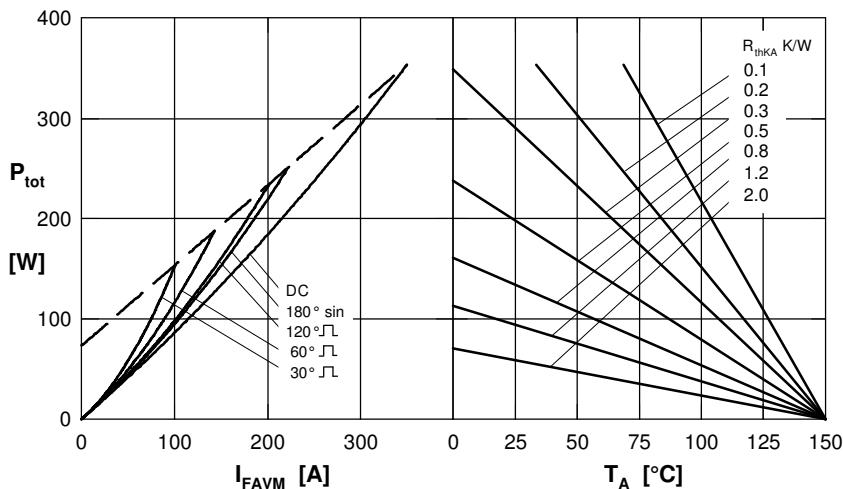
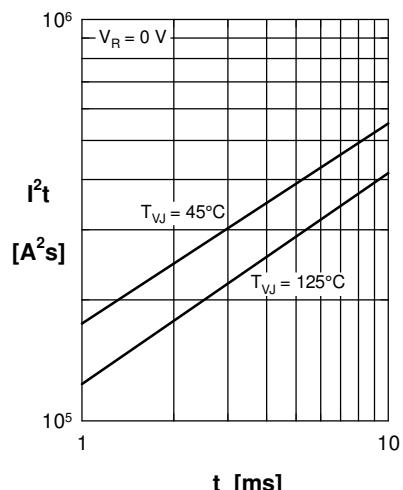
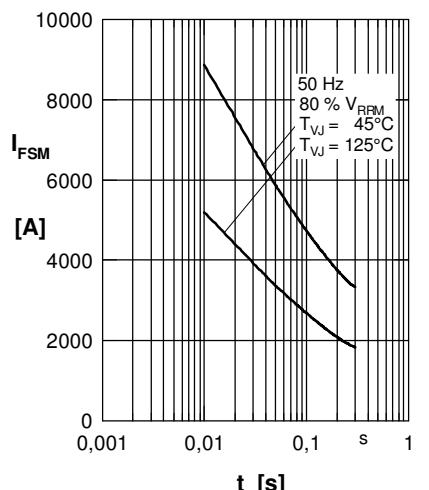
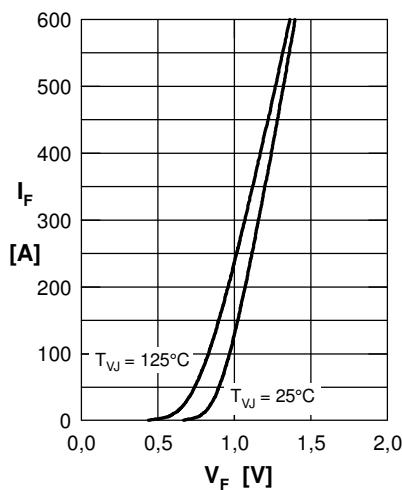
A (3:1)



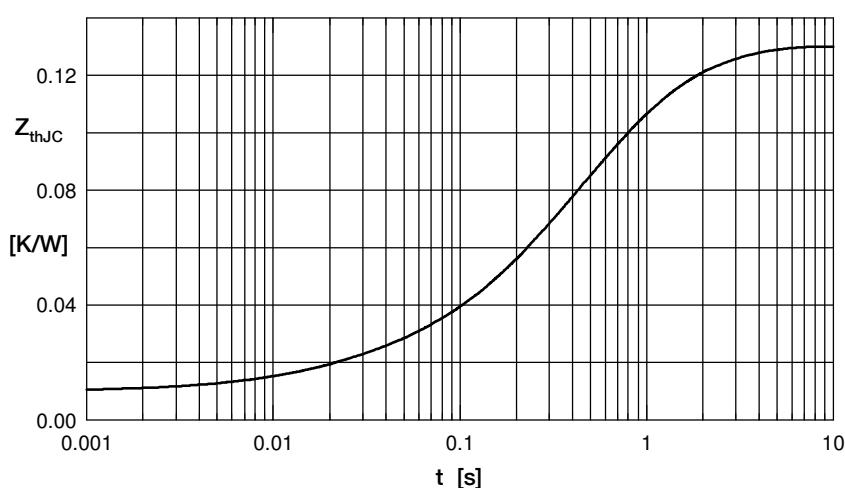
B-B (1:1)



## Rectifier



## Rectifier



Constants for  $Z_{thJC}$  calculation:

i	$R_{thi}$ [ $\text{K}/\text{W}$ ]	$t_i$ [ $\text{s}$ ]
1	0.0100	0.00014
2	0.0065	0.019
3	0.0250	0.180
4	0.0615	0.520
5	0.0270	1.600

Fig. 8 Transient thermal impedance junction to case