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With the principle of "Quality Parts, Customers Priority, Honest Operation, and Considerate Service", our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip, ALPS, ROHM, Xilinx, Pulse, ON, Everlight and Freescale. Main products comprise IC, Modules, Potentiometer, IC Socket, Relay, Connector. Our parts cover such applications as commercial, industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



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# **Standard Rectifier Module**

= 2x 1800 V

120 A

 $V_{\mathsf{F}}$ 1.13 V

## Phase leg

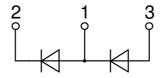
#### Part number

#### MDD95-18N1B



Backside: isolated

**F1** 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: TO-240AA

- 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.

IXYS reserves the right to change limits, conditions and dimensions.

Data according to IEC 60747 and per semiconductor unless otherwise specified

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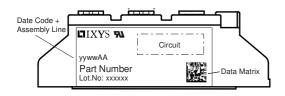




Rectifier			Ratings				
Symbol	Definition	Conditions		min.	typ.	max.	Unit
V <sub>RSM</sub>	max. non-repetitive reverse bloc	king voltage	$T_{VJ} = 25^{\circ}C$			1900	V
V <sub>RRM</sub>	max. repetitive reverse blocking	voltage	$T_{VJ} = 25^{\circ}C$			1800	V
I <sub>R</sub>	reverse current	V <sub>R</sub> = 1800 V	$T_{VJ} = 25^{\circ}C$			200	μΑ
		$V_R = 1800 \text{ V}$	$T_{VJ} = 150$ °C			15	mΑ
V <sub>F</sub>	forward voltage drop	I <sub>F</sub> = 150 A	$T_{VJ} = 25^{\circ}C$			1.20	V
		$I_F = 300 A$				1.43	٧
		I <sub>F</sub> = 150 A	$T_{VJ} = 125$ °C			1.13	V
		$I_F = 300 A$				1.46	٧
I FAV	average forward current	T <sub>C</sub> = 100°C	T <sub>VJ</sub> = 150°C			120	Α
I <sub>F(RMS)</sub>	RMS forward current	180° sine				180	Α
V <sub>F0</sub>	threshold voltage		T <sub>vJ</sub> = 150°C			0.75	V
r <sub>F</sub>	slope resistance } for power	loss calculation only				1.95	mΩ
R <sub>thJC</sub>	thermal resistance junction to ca	ase				0.26	K/W
R <sub>thCH</sub>	thermal resistance case to heats	sink			0.20		K/W
P <sub>tot</sub>	total power dissipation		$T_{C} = 25^{\circ}C$			481	W
I <sub>FSM</sub>	max. forward surge current	t = 10 ms; (50 Hz), sine	$T_{VJ} = 45^{\circ}C$			2.80	kA
		t = 8,3 ms; (60 Hz), sine	$V_R = 0 V$			3.03	kA
		t = 10 ms; (50 Hz), sine	T <sub>vJ</sub> = 150°C			2.38	kA
		t = 8,3 ms; (60 Hz), sine	$V_R = 0 V$			2.57	kA
l²t	value for fusing	t = 10 ms; (50 Hz), sine	$T_{VJ} = 45^{\circ}C$			39.2	kA2s
		t = 8,3 ms; (60 Hz), sine	$V_R = 0 V$			38.1	kA2s
		t = 10 ms; (50 Hz), sine	$T_{VJ} = 150$ °C			28.3	kA2s
		t = 8,3 ms; (60 Hz), sine	$V_R = 0 V$			27.5	kA2s
C¹	junction capacitance	$V_{R} = 400 \text{ V}; f = 1 \text{ MHz}$	$T_{VJ} = 25^{\circ}C$		116		pF



Package TO-240AA			Ratings					
Symbol	Definition	Conditions			min.	typ.	max.	Unit
RMS	RMS current	per terminal					200	Α
T <sub>VJ</sub>	virtual junction temperature				-40		150	°C
T <sub>op</sub>	operation temperature				-40		125	°C
T <sub>stg</sub>	storage temperature				-40		125	°C
Weight						76		g
M <sub>D</sub>	mounting torque				2.5		4	Nm
$\mathbf{M}_{\scriptscriptstyleT}$	terminal torque				2.5		4	Nm
d <sub>Spp/App</sub>	creepage distance on surface   striking distance through air		terminal to terminal	13.0	9.7			mm
d <sub>Spb/Apb</sub>	creepage distance on surfa	ce   striking distance through air	terminal to backside 16.0		16.0			mm
V <sub>ISOL</sub>	isolation voltage $t = 1$ second $t = 1$ minute		50/60 Hz, RMS; IsoL ≤ 1 mA		3600			٧
					3000			٧



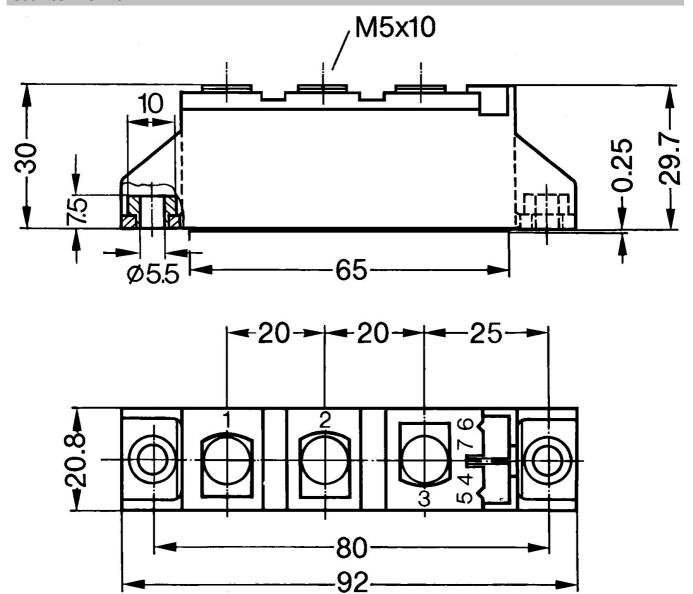
Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	MDD95-18N1B	MDD95-18N1B	Box	36	454427

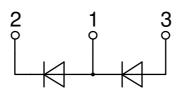
Similar Part	Package	Voltage class
MDD95-08N1B	TO-240AA	800
MDD95-12N1B	TO-240AA	1200
MDD95-14N1B	TO-240AA	1400
MDD95-16N1B	TO-240AA	1600

Equiv	alent Circuits for	Simulation	* on die level	$T_{VJ} = 150 ^{\circ}\text{C}$
$I \rightarrow V_0$	$R_0$	Rectifier		
V <sub>0 max</sub>	threshold voltage	0.75		V
R <sub>0 max</sub>	slope resistance *	0.76		mΩ



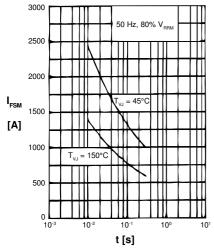
### Outlines TO-240AA

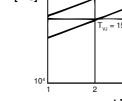


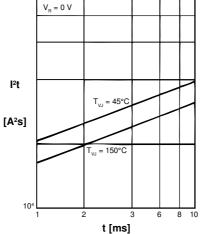




### Rectifier







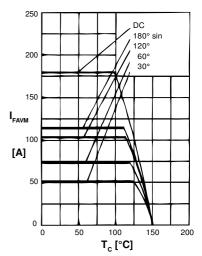


Fig. 1 Surge overload current  $\mathbf{I}_{\text{TSM}}, \ \mathbf{I}_{\text{FSM}}$ : Crest value, t: duration

Fig. 2 I2t versus time (1-10 ms)

Fig. 3 Maximum forward current at case temperature

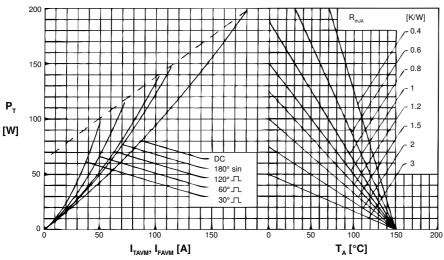


Fig. 4 Power dissipation vs. onstate current and ambient temperature (per diode)

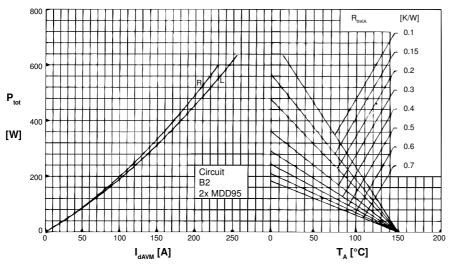


Fig. 6 Single phase rectifier bridge: Power dissipation versus direct output current and ambient temperature; R = resistive load,L = inductive load



#### Rectifier

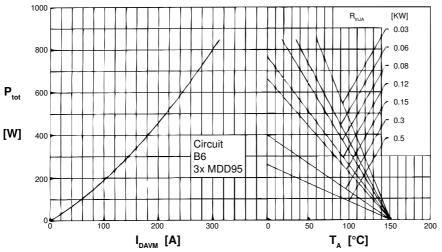


Fig. 6 Three phase rectifier bridge: Power dissipation versus direct output current and ambient temperature

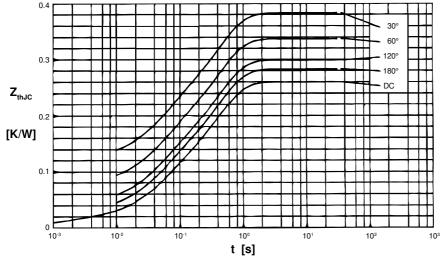


Fig. 7 Transient thermal impedance junction to case (per diode)

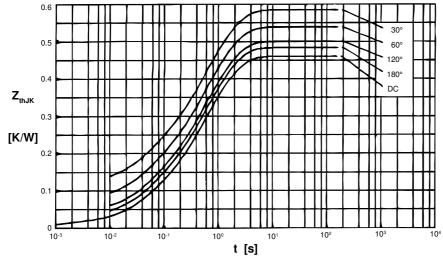


Fig. 8 Transient thermal impedance junction to heatsink (per thyristor)

R<sub>th,IC</sub> for various conduction angles d:

thJC	a
d	R <sub>thJC</sub> [K/V
DC	0.26
180°	0.28
120°	0.30
60°	0.34
30°	0.38

Constants for  $\mathbf{Z}_{\text{thJC}}$  calculation:

i	R <sub>thi</sub> [K/W]	t <sub>i</sub> [s]
1	0.013	0.0012
2	0.072	0.0470
3	0.175	0.3940

 $\boldsymbol{R}_{thJK}$  for various conduction angles d:

UIUIX	
d	$R_{thJK}$ [K/V
DC	0.46
180°	0.48
120°	0.50
60°	0.54
30°	0.58

Constants for  $\mathbf{Z}_{\text{\tiny thJK}}$  calculation:

i	$R_{thi}$ [K/W]	t <sub>,</sub> [s]
1	0.013	0.0012
2	0.072	0.0470
3	0.175	0.3940
4	0.200	1.3200