

Standard Rectifier Module

V_{RRM} = 2x1600 V

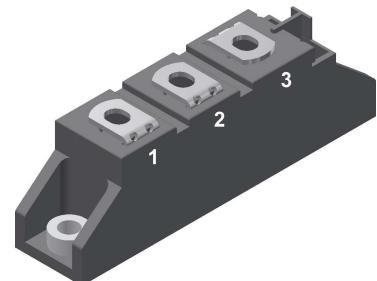
I_{FAV} = 120 A

V_F = 1.13 V

Phase leg

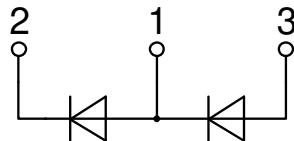
Part number

MDD95-16N1B



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: TO-240AA

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

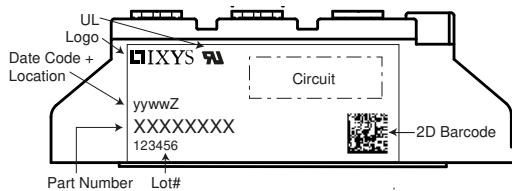
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Rectifier

Symbol	Definition	Conditions	Ratings			
			min.	typ.	max.	
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	$V_R = 1600 \text{ V}$ $V_R = 1600 \text{ V}$	$T_{VJ} = 25^\circ\text{C}$ $T_{VJ} = 150^\circ\text{C}$		200 15	μA mA
V_F	forward voltage drop	$I_F = 150 \text{ A}$ $I_F = 300 \text{ A}$ $I_F = 150 \text{ A}$ $I_F = 300 \text{ A}$	$T_{VJ} = 25^\circ\text{C}$ $T_{VJ} = 125^\circ\text{C}$		1.20 1.43 1.13 1.46	V V V V
I_{FAV}	average forward current	$T_C = 100^\circ\text{C}$	$T_{VJ} = 150^\circ\text{C}$		120	A
$I_{F(\text{RMS})}$	RMS forward current	180° sine			180	A
V_{F0} r_F	threshold voltage slope resistance } for power loss calculation only		$T_{VJ} = 150^\circ\text{C}$		0.75 1.95	V $\text{m}\Omega$
R_{thJC}	thermal resistance junction to case				0.26	K/W
R_{thCH}	thermal resistance case to heatsink			0.2		K/W
P_{tot}	total power dissipation		$T_C = 25^\circ\text{C}$		481	W
I_{FSM}	max. forward surge current	$t = 10 \text{ ms}; (50 \text{ Hz}), \text{sine}$ $t = 8,3 \text{ ms}; (60 \text{ Hz}), \text{sine}$	$T_{VJ} = 45^\circ\text{C}$ $V_R = 0 \text{ V}$		2.80 3.03	kA kA
		$t = 10 \text{ ms}; (50 \text{ Hz}), \text{sine}$ $t = 8,3 \text{ ms}; (60 \text{ Hz}), \text{sine}$	$T_{VJ} = 150^\circ\text{C}$ $V_R = 0 \text{ V}$		2.38 2.57	kA kA
I^2t	value for fusing	$t = 10 \text{ ms}; (50 \text{ Hz}), \text{sine}$ $t = 8,3 \text{ ms}; (60 \text{ Hz}), \text{sine}$	$T_{VJ} = 45^\circ\text{C}$ $V_R = 0 \text{ V}$		39.2 38.1	kA^2s kA^2s
		$t = 10 \text{ ms}; (50 \text{ Hz}), \text{sine}$ $t = 8,3 \text{ ms}; (60 \text{ Hz}), \text{sine}$	$T_{VJ} = 150^\circ\text{C}$ $V_R = 0 \text{ V}$		28.3 27.5	kA^2s kA^2s
C_J	junction capacitance	$V_R = 400 \text{ V}; f = 1 \text{ MHz}$	$T_{VJ} = 25^\circ\text{C}$	116		pF

Package TO-240AA			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				76		g
M_D	mounting torque		2.5		4	Nm
M_T	terminal torque		2.5		4	Nm
$d_{Spp/App}$	creepage distance on surface / striking distance through air		terminal to terminal	13.0	9.7	mm
$d_{Spb/Apb}$			terminal to backside	16.0	16.0	mm
V_{ISOL}	isolation voltage	t = 1 second t = 1 minute 50/60 Hz, RMS; $I_{ISOL} \leq 1$ mA		3600		V
				3000		V

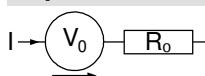


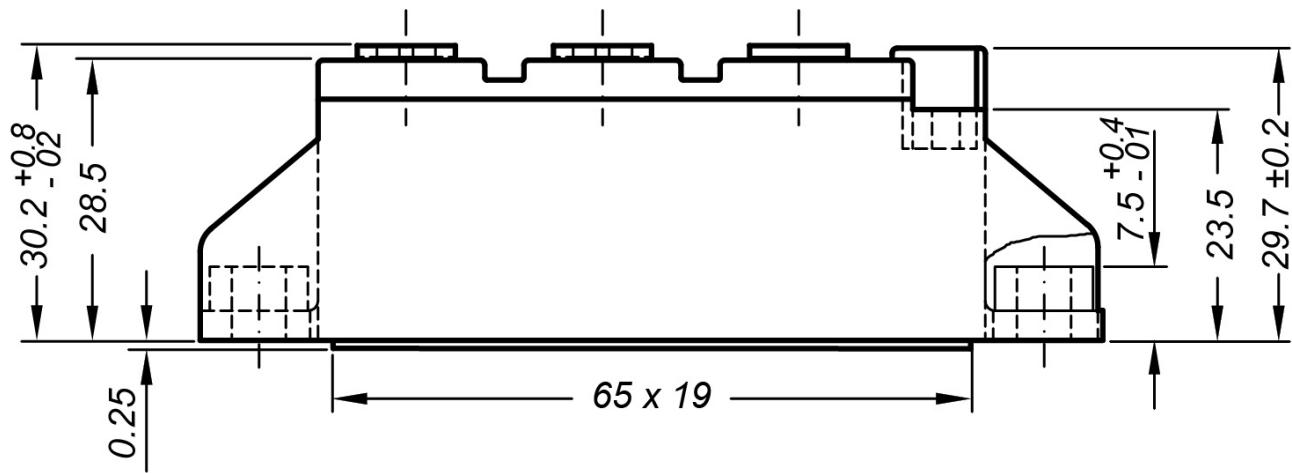
Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	MDD95-16N1B	MDD95-16N1B	Box	36	453161

Similar Part	Package	Voltage class
MDD95-08N1B	TO-240AA	800
MDD95-12N1B	TO-240AA	1200
MDD95-14N1B	TO-240AA	1400
MDD95-18N1B	TO-240AA	1800

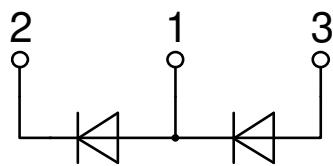
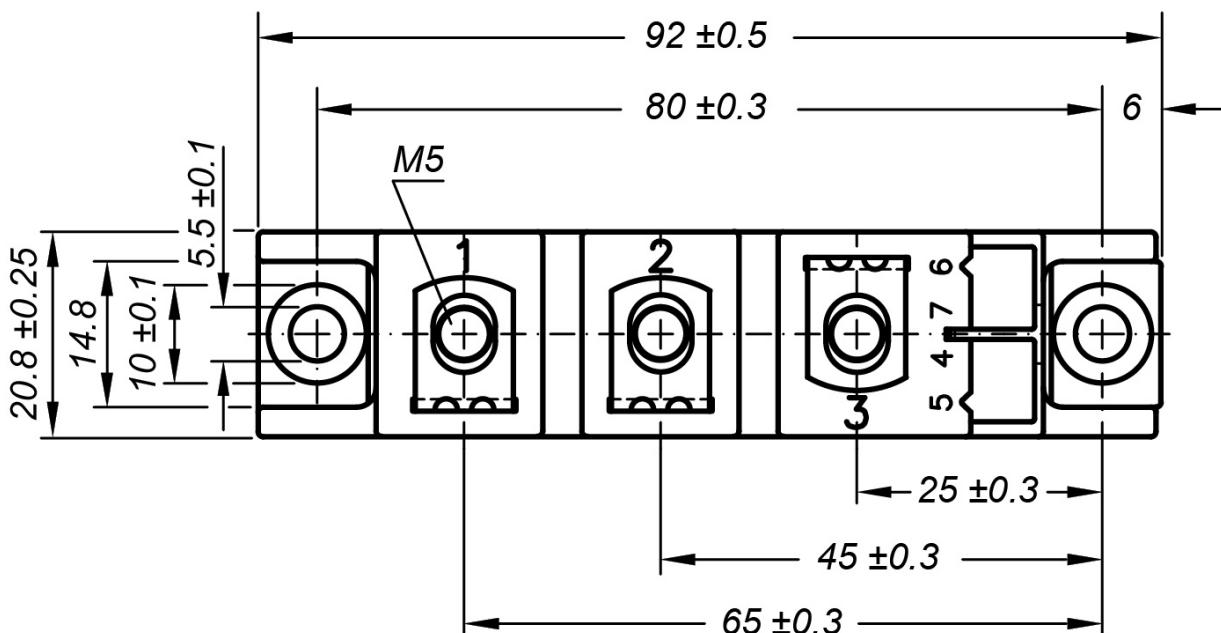
Equivalent Circuits for Simulation
^{*}on die level

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

	Rectifier
$V_{0\ max}$	threshold voltage 0.75 V
$R_{0\ max}$	slope resistance * 0.76 mΩ

Outlines TO-240AA


General tolerance: DIN ISO 2768 class „c“



Rectifier

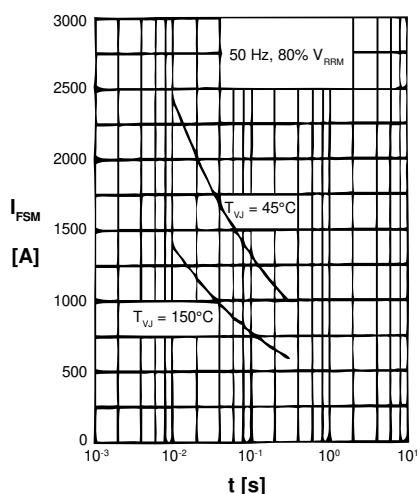


Fig. 1 Surge overload current
 I_{TSM}, I_{FSM} : Crest value, t : duration

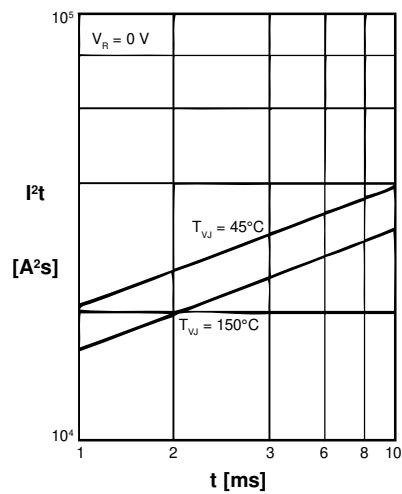


Fig. 2 I^2t versus time (1-10 ms)

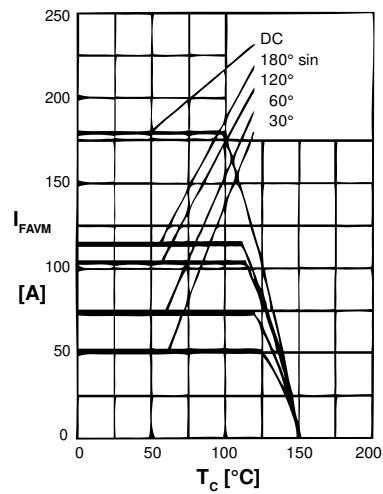


Fig. 3 Maximum forward current
at case temperature

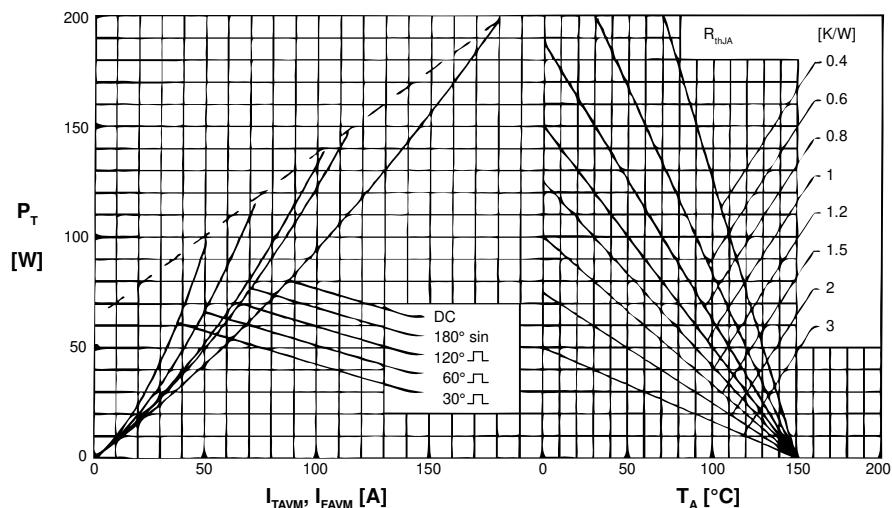


Fig. 4 Power dissipation vs. onstate current and ambient temperature (per diode)

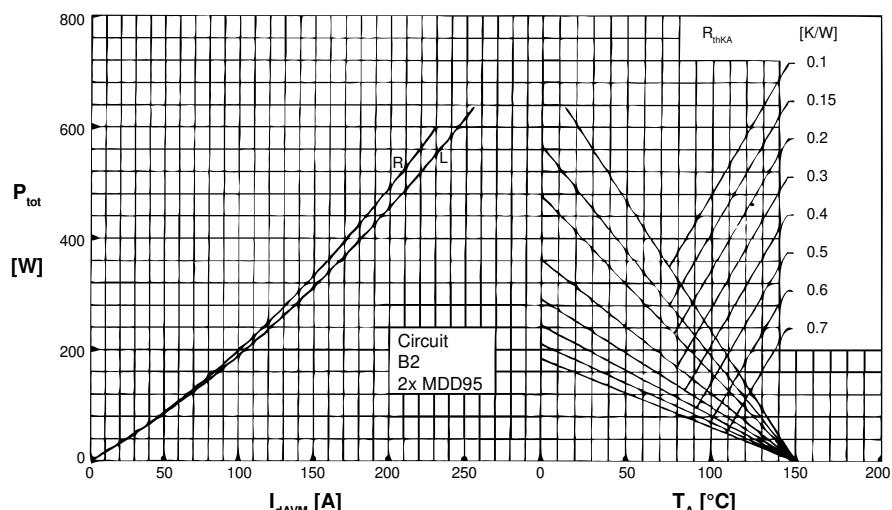


Fig. 6 Single phase rectifier bridge: Power dissipation versus direct output current
and ambient temperature; R = resistive load, L = inductive load

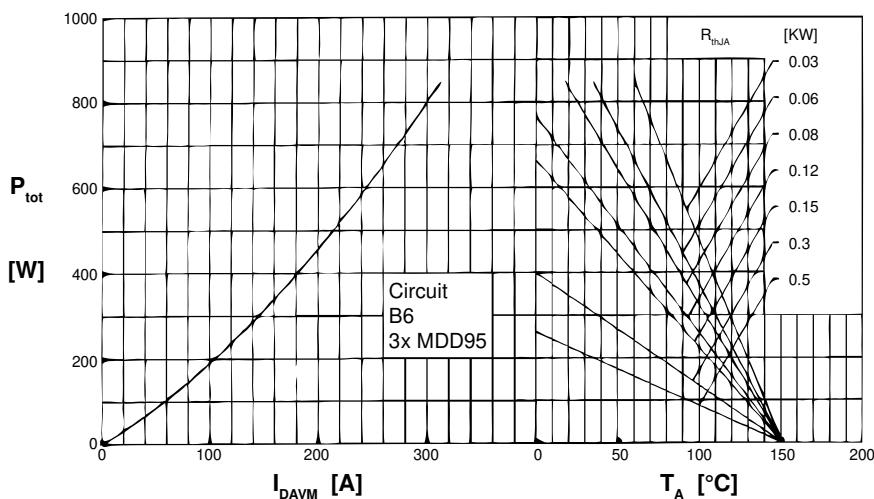
Rectifier


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

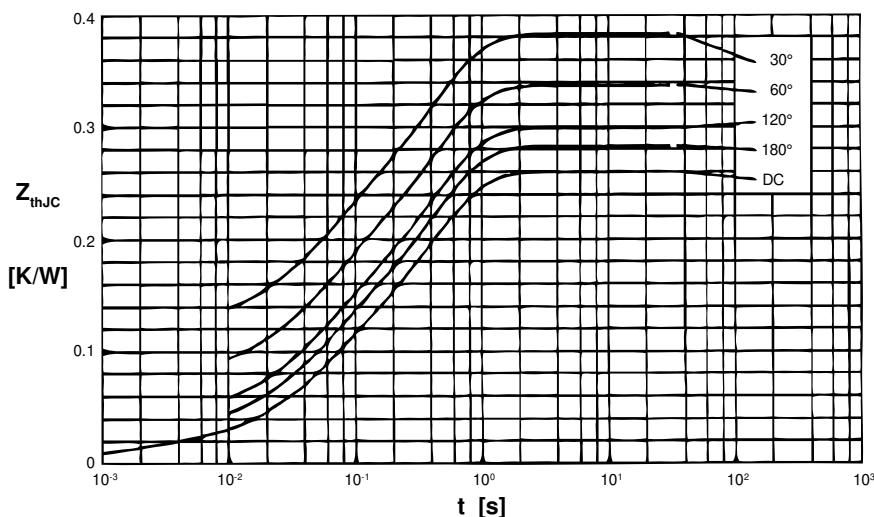


Fig. 7 Transient thermal impedance junction to case (per diode)

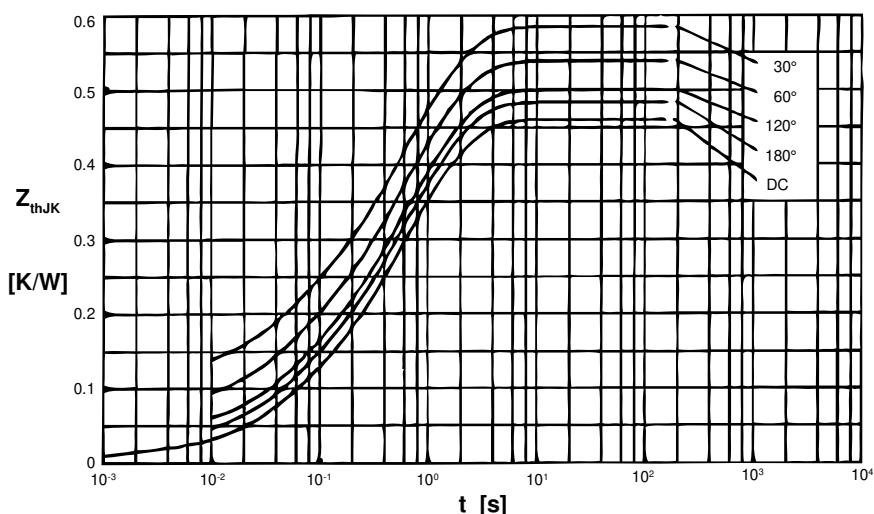


Fig. 8 Transient thermal impedance junction to heatsink (per thyristor)

R_{thJC} for various conduction angles d:

d	R_{thJC} [K/W]
DC	0.26
180°	0.28
120°	0.30
60°	0.34
30°	0.38

Constants for Z_{thJC} calculation:

i	R_{thi} [K/W]	t_i [s]
1	0.013	0.0012
2	0.072	0.0470
3	0.175	0.3940

R_{thJK} for various conduction angles d:

d	R_{thJK} [K/W]
DC	0.46
180°	0.48
120°	0.50
60°	0.54
30°	0.58

Constants for Z_{thJK} calculation:

i	R_{thi} [K/W]	t_i [s]
1	0.013	0.0012
2	0.072	0.0470
3	0.175	0.3940
4	0.200	1.3200

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На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

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