Standard Rectifier Module

V_{RRM} = 2x 1800 V

I_{FAV} = 224 A

V_F = 1.07 V

Phase leg

Part number

MDD200-18N1
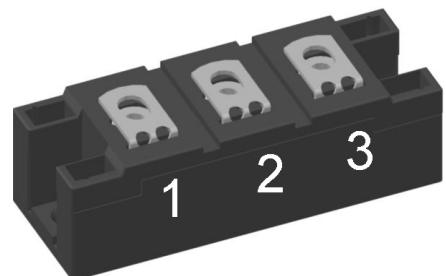
Backside: isolated

E72873
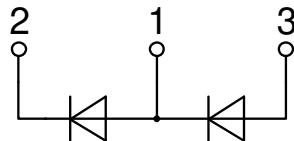
Features / Advantages:
- Package with DCB ceramic
- Improved temperature and power cycling
- Planar passivated chips
- Very low forward voltage drop
- Very low leakage current

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

Disclaimer Notice

Information furnished is believed to be accurate and reliable. However, users should independently evaluate the suitability of and test each product selected for their own applications. Littelfuse products are not designed for, and may not be used in, all applications. Read complete Disclaimer Notice at www.littelfuse.com/disclaimer-electronics.

Rectifier

Ratings

Symbol	Definition	Conditions		min.	typ.	max.	Unit
V_{RSM}	max. non-repetitive reverse blocking voltage		T_{VJ} = 25°C			1900	V
V_{RRM}	max. repetitive reverse blocking voltage		T_{VJ} = 25°C			1800	V
I_R	reverse current	V_R = 1800 V	T_{VJ} = 25°C			1	mA
		V_R = 1800 V	T_{VJ} = 150°C			20	mA
V_F	forward voltage drop	I_F = 300 A	T_{VJ} = 25°C			1.16	V
		I_F = 600 A				1.39	V
		I_F = 300 A	T_{VJ} = 125°C			1.07	V
		I_F = 600 A				1.36	V
I_{FAV}	average forward current	T_C = 100°C	T_{VJ} = 150°C			224	A
$I_{F(RMS)}$	RMS forward current	180° sine d = 0.5				350	A
V_{F0}	threshold voltage } for power loss calculation only		T_{VJ} = 150°C			0.80	V
r_F	slope resistance					0.6	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°C			960	W
I_{FSM}	max. forward surge current	t = 10 ms; (50 Hz), sine	T_{VJ} = 45°C			10.5	kA
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			11.3	kA
		t = 10 ms; (50 Hz), sine	T_{VJ} = 150°C			8.93	kA
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			9.64	kA
I^2t	value for fusing	t = 10 ms; (50 Hz), sine	T_{VJ} = 45°C			551.3	kA²s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			535.0	kA²s
		t = 10 ms; (50 Hz), sine	T_{VJ} = 150°C			398.3	kA²s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			386.6	kA²s
C_J	junction capacitance	V_R = 1100 V; f = 1 MHz	T_{VJ} = 25°C		230		pF

Package   Y4

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

Date Code (DC)
+
Production
Index (PI)

IXYS   Ⓤ
yywwAA
Part Number
Lot.No: xxxxxx
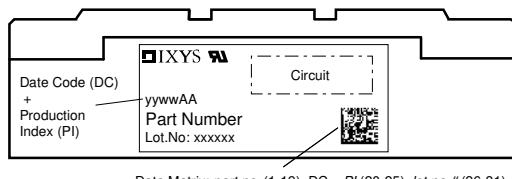
Circuit

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	MDD200-18N1	MDD200-18N1	Box	6	499641

Equivalent Circuits for Simulation   ** on die level* $T_{VJ} = 150°C$


Rectifier

$V_{0\ max}$	threshold voltage	0.8	V
$R_{0\ max}$	slope resistance *	0.4	mΩ
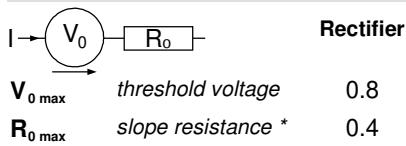
Outlines   Y4
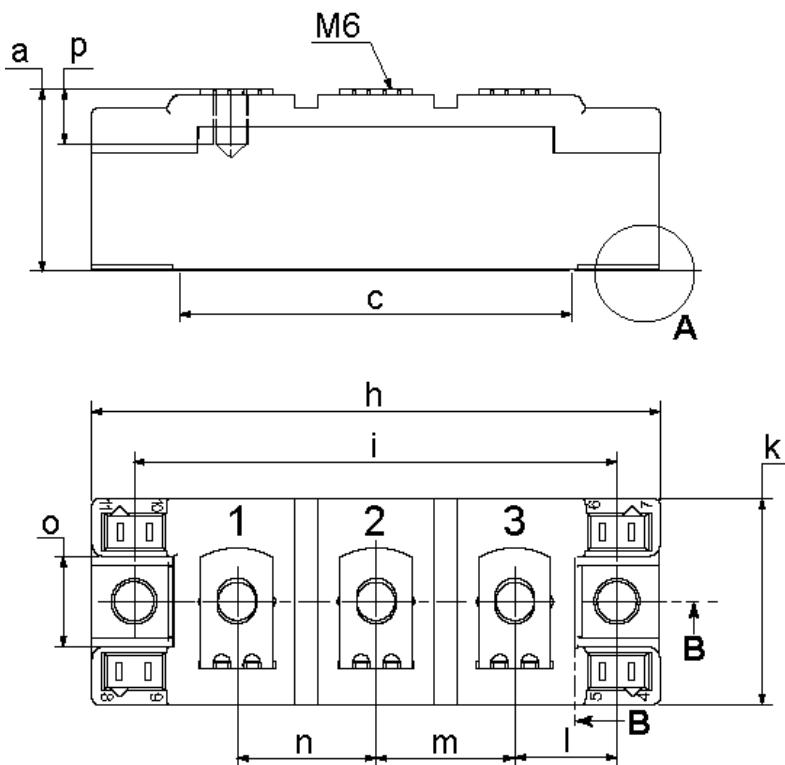
Dim.	MIN [mm]	MAX [mm]	MIN [inch]	MAX [inch]
a	30.0	30.6	1.181	1.205
b	typ. 0.25		typ. 0.010	
c	64.0	65.0	2.520	2.559
d	6.5	7.0	0.256	0.275
e	4.9	5.1	0.193	0.201
h	93.5	94.5	3.681	3.720
i	79.5	80.5	3.130	3.169
k	33.4	34.0	1.315	1.339
l	16.7	17.3	0.657	0.681
m	22.7	23.3	0.894	0.917
n	22.7	23.3	0.894	0.917
o	14.0	15.0	0.551	0.591
p	typ. 10.5		typ. 0.413	

A (3:1)
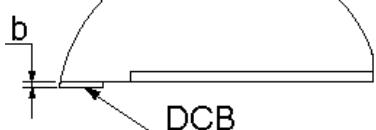
B-B (1:1)
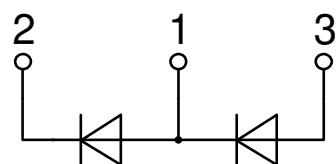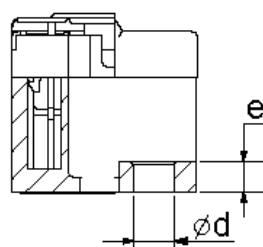
Rectifier
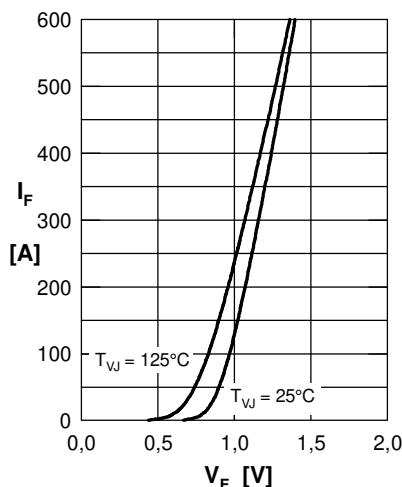
Fig. 1 Forward current versus voltage drop
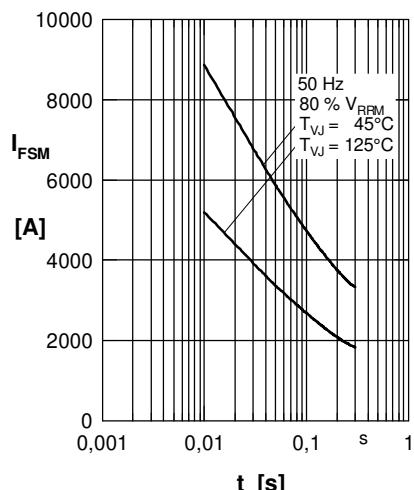
Fig. 2 Surge overload current
I_{FSM}: Crest value, t: duration
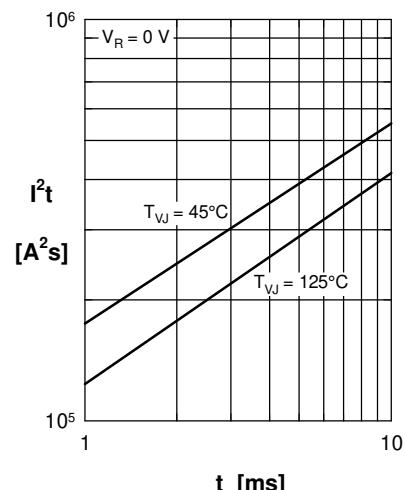

Fig. 3 I^2t versus time (1-10 ms)
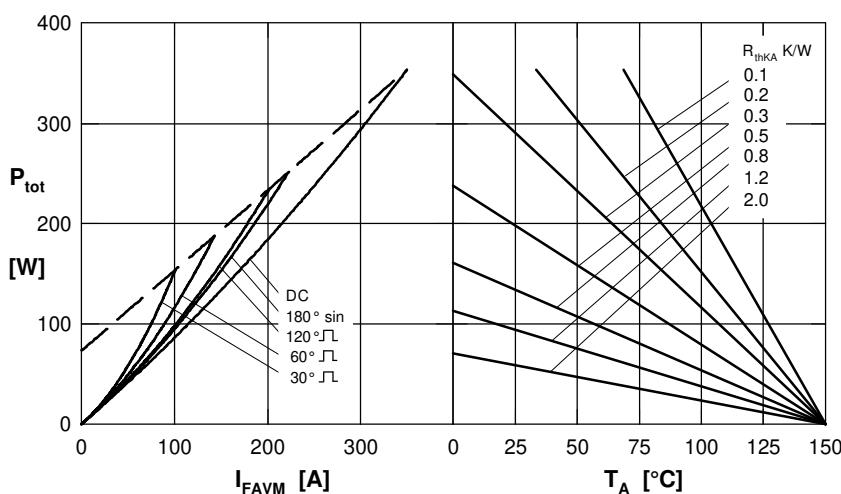
Fig.4 Power dissipation versus forward current and ambient temperature (per diode)
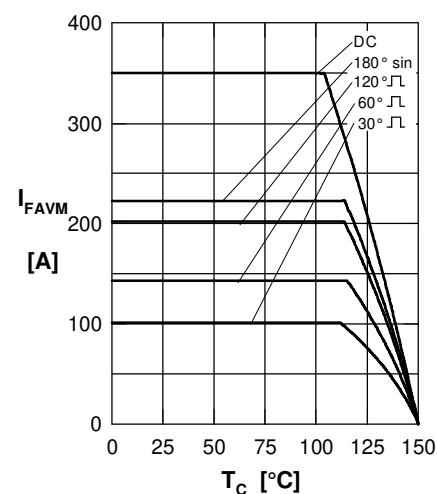

Fig. 5 Maximum forward current at case temperature
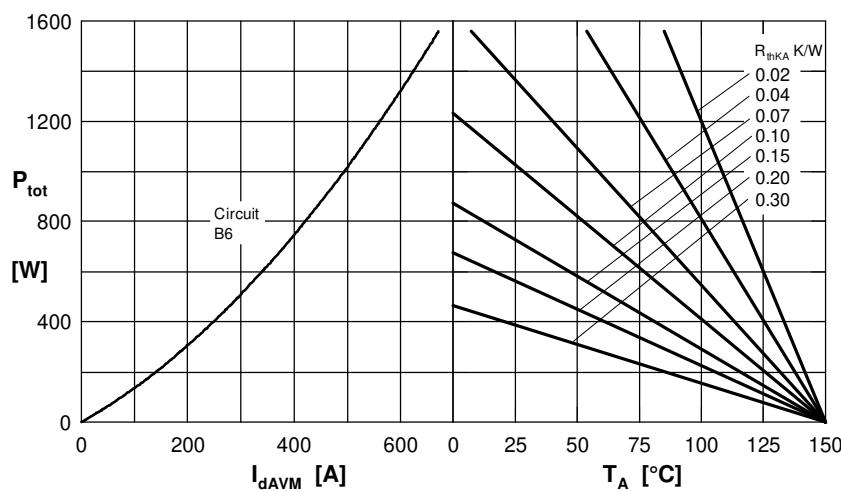
Fig.6 Three phase rectifier bridge: Power dissipation versus direct output current and ambient temperature
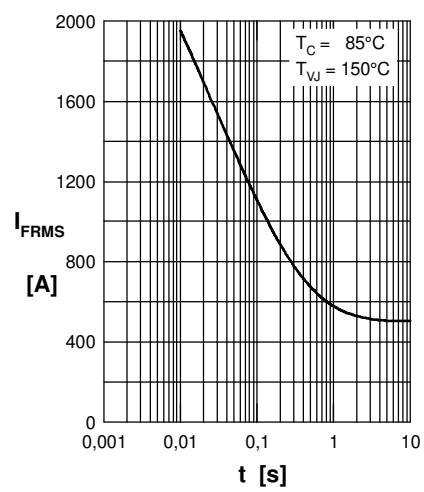

Fig. 7 Rated RMS current versus time (360° conduction)

Rectifier
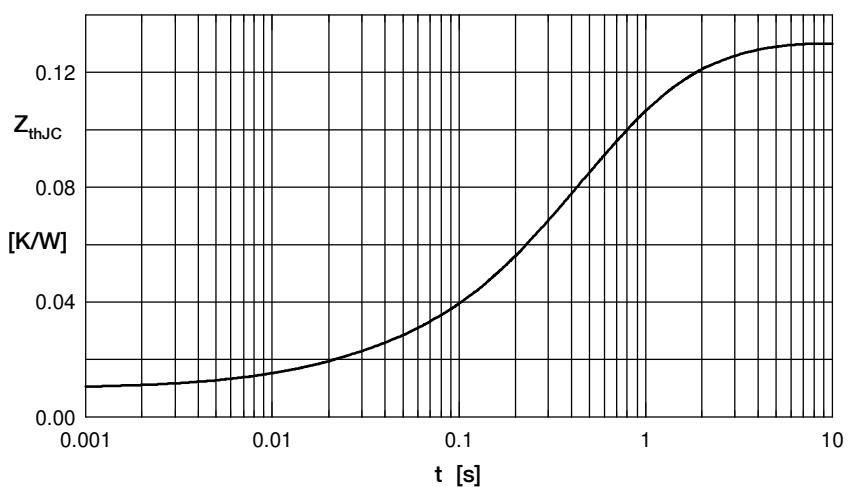
Fig. 8 Transient thermal impedance junction to case

Constants for Z_{thJC} calculation:

i	R_{thi} [K/W]	t_i [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

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