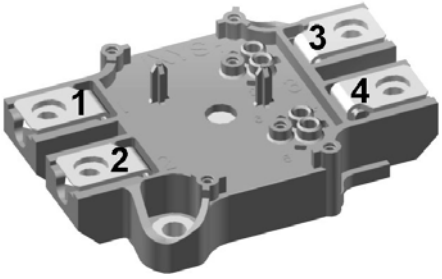
Standard Rectifier Module

V_{RRM} = 2x 1600 V
I_{FAV} = 200 A
V_F = 1.06 V

Phase leg

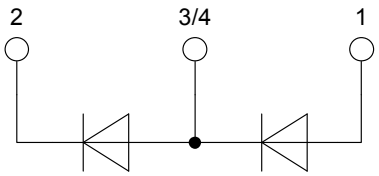
Part number

MDMA200P1600SA



Backside: isolated

E72873



Features / Advantages:

- Planar passivated chips
- Very low leakage current
- Very low forward voltage drop
- Improved thermal behaviour

Applications:

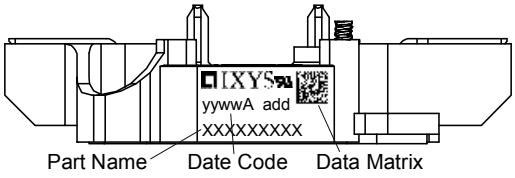
- Diode for main rectification
- For single and three phase bridge configurations

Package: SimBus A

- Isolation Voltage: 4800 V~
- Industry standard outline
- RoHS compliant
- Gate: Spring contacts for solder-free PCB-mounting
- Height: 17 mm
- Base plate: Copper internally DCB isolated
- Advanced power cycling

Rectifier				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
V_{RSM}	*max. non-repetitive reverse blocking voltage*		T_{VJ} = 25°C			1700	V
V_{RRM}	*max. repetitive reverse blocking voltage*		T_{VJ} = 25°C			1600	V
I_R	*reverse current*	V_R = 1600 V	T_{VJ} = 25°C			200	µA
		V_R = 1600 V	T_{VJ} = 150°C			15	mA
V_F	*forward voltage drop*	I_F = 200 A	T_{VJ} = 25°C			1.13	V
		I_F = 400 A				1.33	V
		I_F = 200 A	T_{VJ} = 125 °C			1.06	V
		I_F = 400 A				1.32	V
I_{FAV}	*average forward current*	T_C = 110°C	T_{VJ} = 150°C			200	A
		rectangular d = 0.5					
V_{F0}	*threshold voltage* } *for power loss calculation only*		T_{VJ} = 150°C			0.76	V
r_F	*slope resistance* }					1.4	mΩ
R_{thJC}	*thermal resistance junction to case*					0.15	K/W
R_{thCH}	*thermal resistance case to heatsink*				0.08		K/W
P_{tot}	*total power dissipation*		T_C = 25°C			830	W
I_{FSM}	*max. forward surge current*	t = 10 ms; (50 Hz), sine	T_{VJ} = 45°C			6.00	kA
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			6.48	kA
		t = 10 ms; (50 Hz), sine	T_{VJ} = 150°C			5.10	kA
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			5.51	kA
I^2t	*value for fusing*	t = 10 ms; (50 Hz), sine	T_{VJ} = 45°C			180.0	kA²s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			174.7	kA²s
		t = 10 ms; (50 Hz), sine	T_{VJ} = 150°C			130.1	kA²s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			126.3	kA²s
C_J	*junction capacitance*	V_R = 400 V; f = 1 MHz	T_{VJ} = 25°C		273		pF

Package SimBus A					Ratings			
Symbol	Definition	Conditions			min.	typ.	max.	Unit
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						152		g
M_D	*mounting torque*				3		5	Nm
M_T	*terminal torque*				2.5		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*	14.0	10.0			mm
V_{ISOL}	*isolation voltage*	t = 1 second	50/60 Hz, RMS; I_{ISOL} ≤ 1 mA		4800			V
		t = 1 minute			4000			V



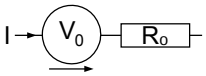
Part number

M = Module
D = Diode
M = Standard Rectifier
A = (up to 1800V)
200 = Current Rating [A]
P = Phase leg
1600 = Reverse Voltage [V]
SA = SimBus A

Ordering	Part Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	MDMA200P1600SA	MDMA200P1600SA	Blister	9	510373

Equivalent Circuits for Simulation

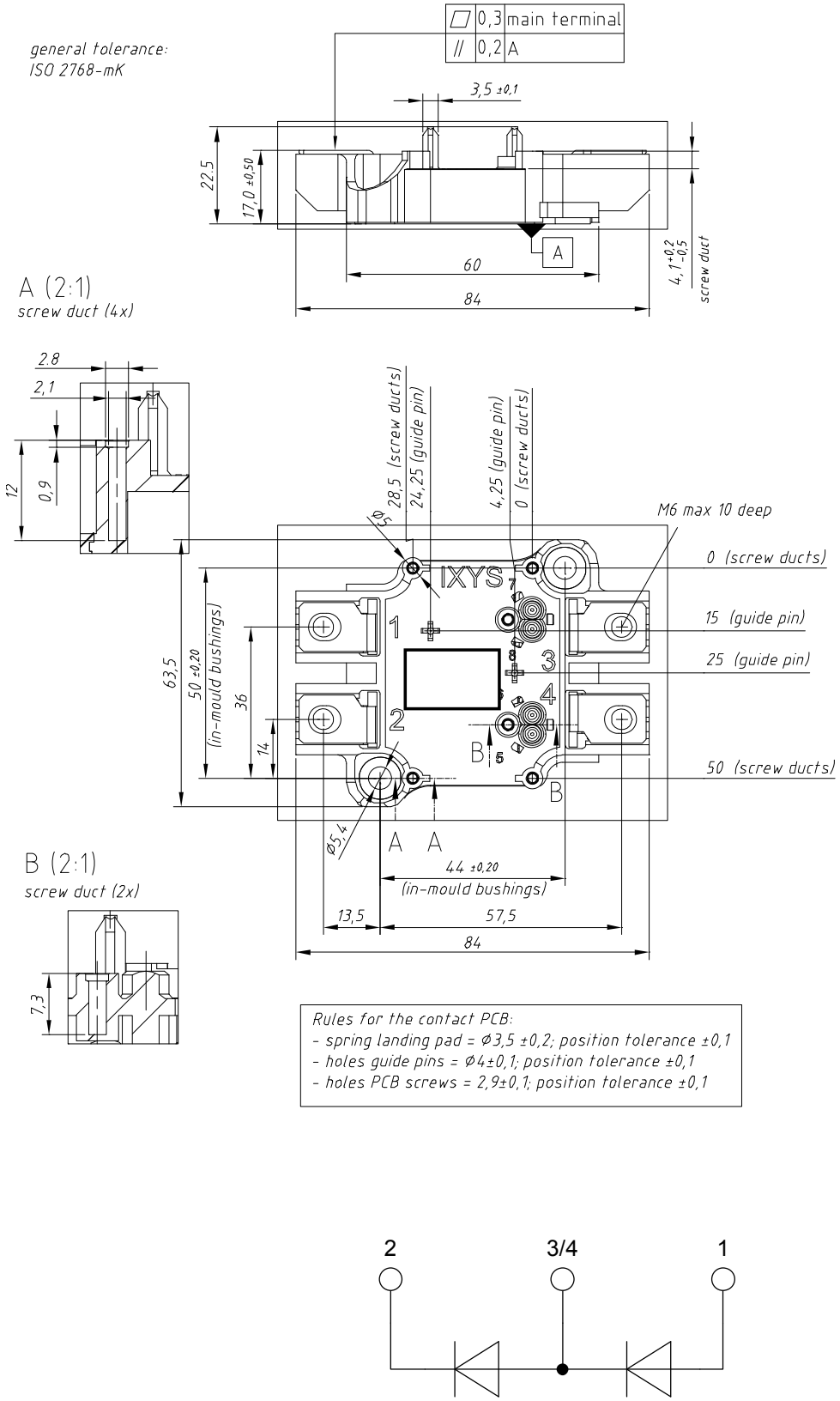
** on die level* T_{VJ} = 150 °C



Rectifier

$V_{0\,max}$	*threshold voltage*	0.76	V
$R_{0\,max}$	*slope resistance **	0.8	mΩ

Outlines SimBus A



Rules for the contact PCB:
- spring landing pad = Ø3,5 ±0,2; position tolerance ±0,1
- holes guide pins = Ø4±0,1; position tolerance ±0,1
- holes PCB screws = 2,9±0,1; position tolerance ±0,1

Rectifier

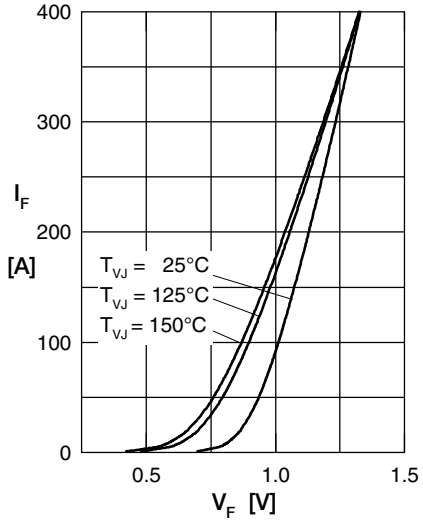


Fig. 1 Forward current versus voltage drop per diode

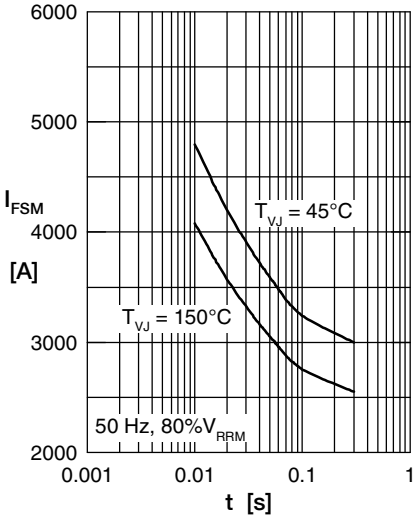


Fig. 2 Surge overload current vs. time per diode

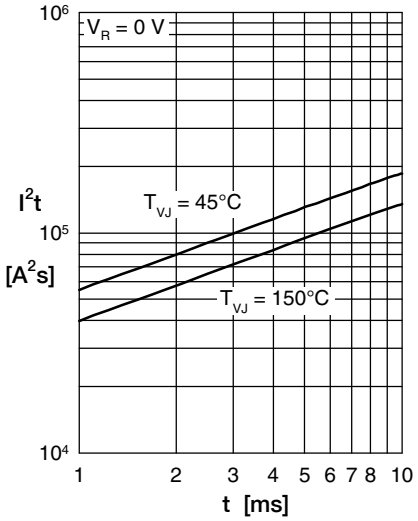


Fig. 3 I^2t versus time per diode

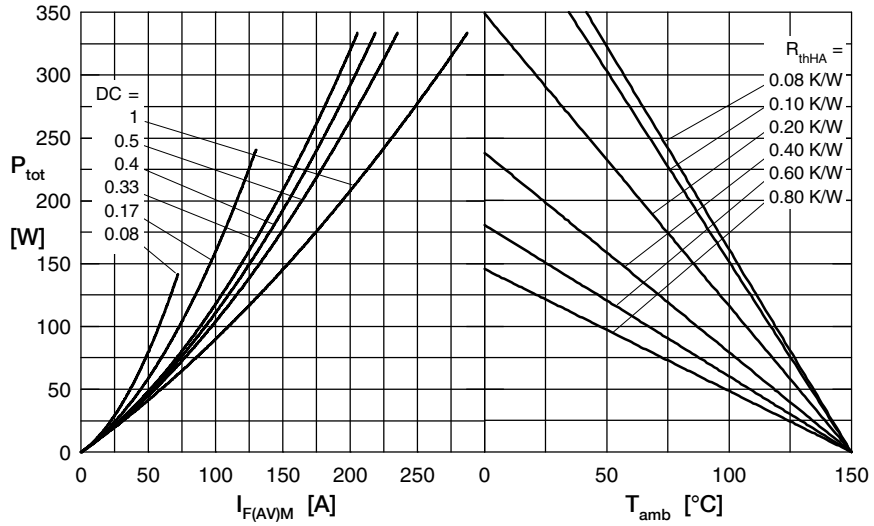


Fig. 4 Power dissipation vs. forward current and ambient temperature per diode

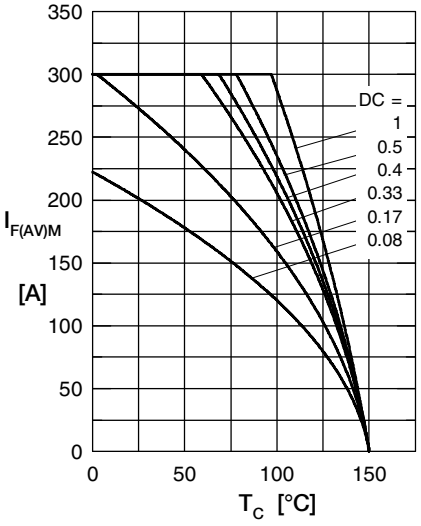


Fig. 5 Max. forward current vs. case temperature per diode

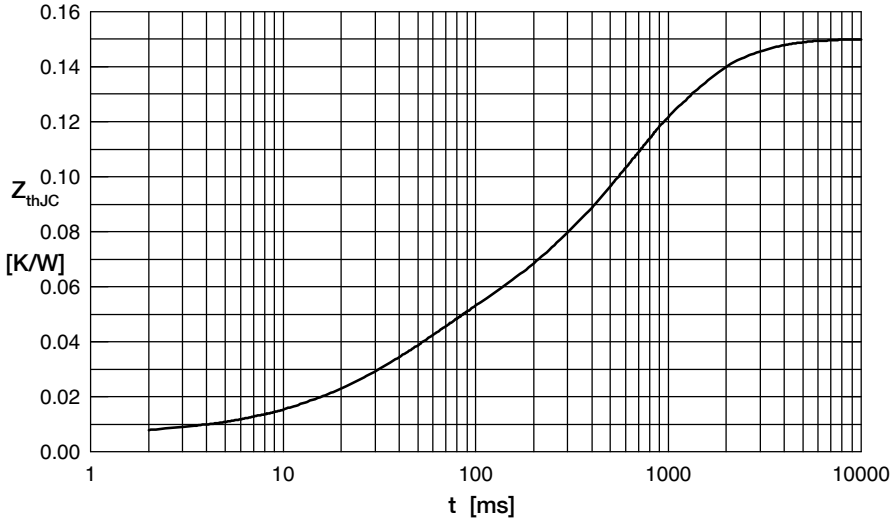


Fig. 6 Transient thermal impedance junction to case vs. time per diode

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.006	0.0005
2	0.035	0.0400
3	0.079	0.5500
4	0.030	1.5000

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MDMA200P1600SA