

Standard Rectifier Module

$$V_{RRM} = 2 \times 1600 \text{ V}$$

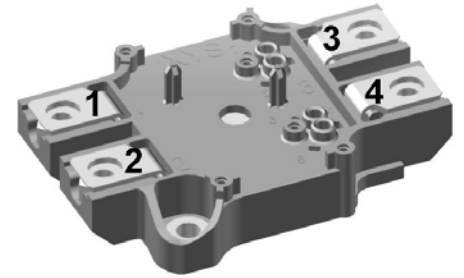
$$I_{FAV} = 200 \text{ A}$$

$$V_F = 1.06 \text{ V}$$


Phase leg

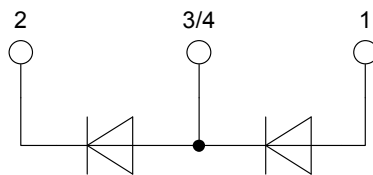
Part number

MDMA200P1600SA



Backside: isolated

 E72873



Features / Advantages:

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

Applications:

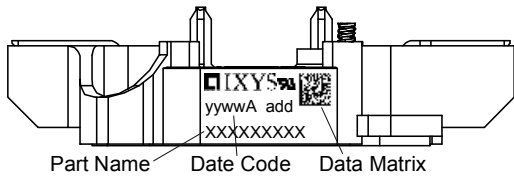
- Diode for main rectification
- For single and three phase bridge configurations

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

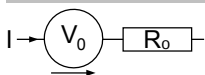
Rectifier				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
V_{RSM}	max. non-repetitive reverse blocking voltage					1700	V
V_{RRM}	max. repetitive reverse blocking voltage					1600	V
I_R	reverse current	$V_R = 1600$ V	$T_{VJ} = 25^\circ\text{C}$			200	μA
		$V_R = 1600$ V	$T_{VJ} = 150^\circ\text{C}$			15	mA
V_F	forward voltage drop	$I_F = 200$ A	$T_{VJ} = 25^\circ\text{C}$			1.13	V
		$I_F = 400$ A				1.33	V
		$I_F = 200$ A	$T_{VJ} = 125^\circ\text{C}$			1.06	V
		$I_F = 400$ A				1.32	V
I_{FAV}	average forward current	$T_C = 110^\circ\text{C}$ rectangular	$T_{VJ} = 150^\circ\text{C}$			200	A
V_{FO}	threshold voltage	} for power loss calculation only				0.76	V
r_F	slope resistance					1.4	m Ω
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			$T_C = 25^\circ\text{C}$		830	W
I_{FSM}	max. forward surge current	$t = 10$ ms; (50 Hz), sine	$T_{VJ} = 45^\circ\text{C}$			6.00	kA
		$t = 8,3$ ms; (60 Hz), sine	$V_R = 0$ V			6.48	kA
		$t = 10$ ms; (50 Hz), sine	$T_{VJ} = 150^\circ\text{C}$			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	$T_{VJ} = 45^\circ\text{C}$			180.0	kA ² s
		$t = 8,3$ ms; (60 Hz), sine	$V_R = 0$ V			174.7	kA ² s
		$t = 10$ ms; (50 Hz), sine	$T_{VJ} = 150^\circ\text{C}$			130.1	kA ² s
		$t = 8,3$ ms; (60 Hz), sine	$V_R = 0$ V			126.3	kA ² s
C_J	junction capacitance	$V_R = 400$ V; $f = 1$ MHz	$T_{VJ} = 25^\circ\text{C}$		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		4800		V
		t = 1 minute	50/60 Hz, RMS; $I_{ISOL} \leq 1$ mA	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

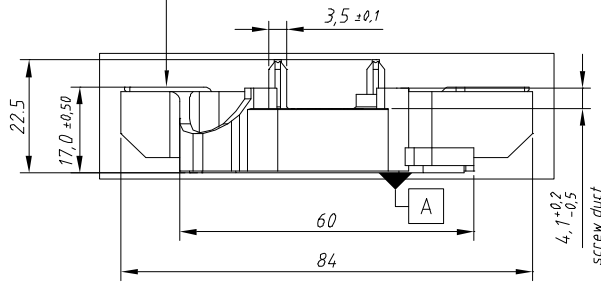
Equivalent Circuits for Simulation
** on die level*
 $T_{VJ} = 150\text{ °C}$

Rectifier

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

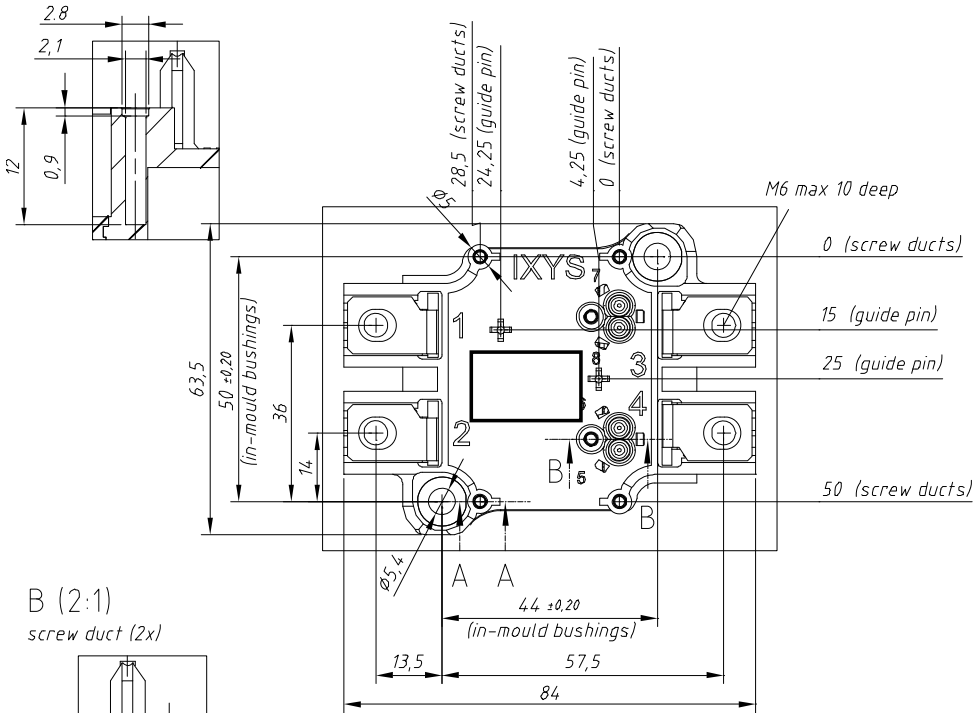
Outlines SimBus A

general tolerance:
ISO 2768-mK

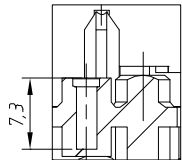
	0,3	main terminal
	0,2	A



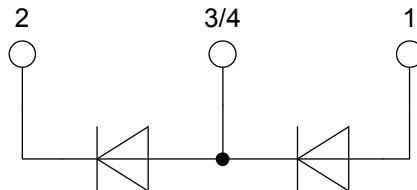
A (2:1)
screw duct (4x)



B (2:1)
screw duct (2x)



Rules for the contact PCB:
 - spring landing pad = $\phi 3,5 \pm 0,2$; position tolerance $\pm 0,1$
 - holes guide pins = $\phi 4 \pm 0,1$; position tolerance $\pm 0,1$
 - holes PCB screws = $2,9 \pm 0,1$; position tolerance $\pm 0,1$



Rectifier

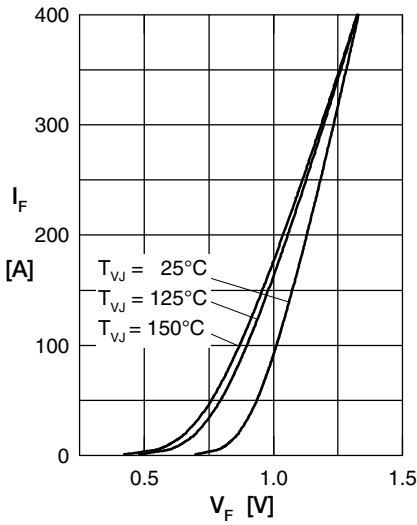


Fig. 1 Forward current versus voltage drop per diode

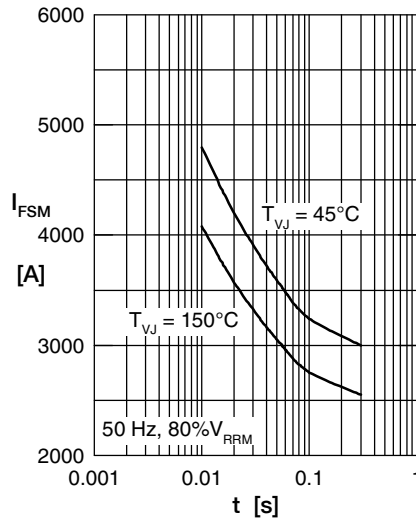


Fig. 2 Surge overload current vs. time per diode

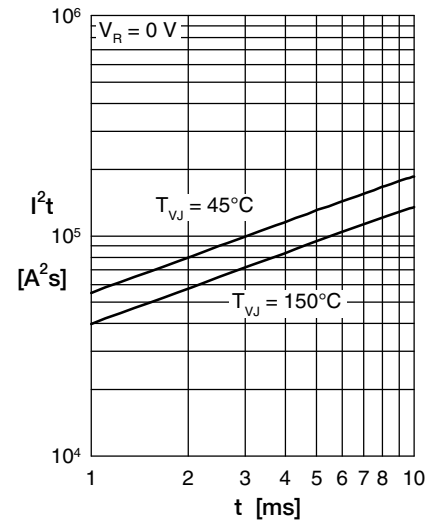


Fig. 3 I^2t versus time per diode

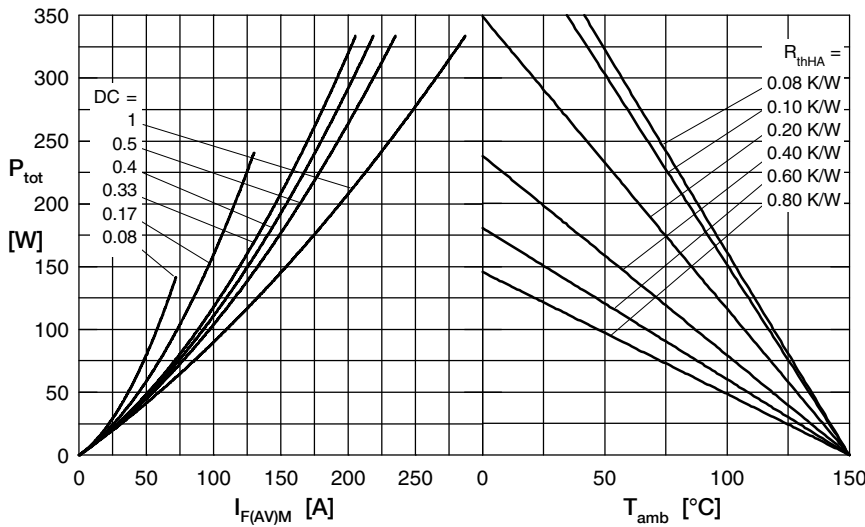


Fig. 4 Power dissipation vs. forward current and ambient temperature per diode

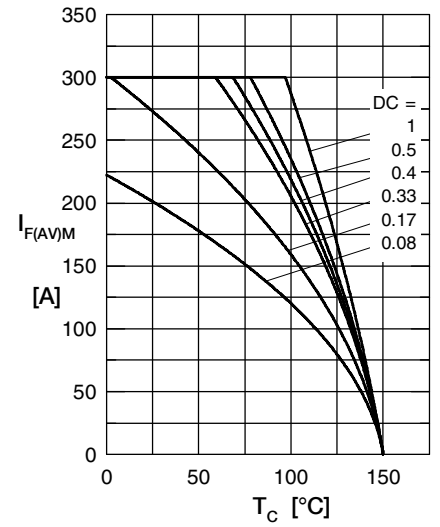


Fig. 5 Max. forward current vs. case temperature per diode

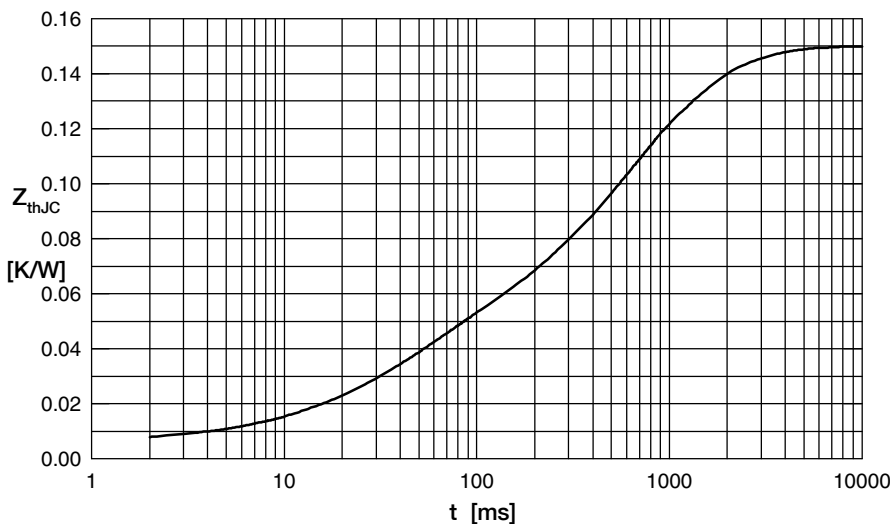


Fig. 6 Transient thermal impedance junction to case vs. time per diode

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