

# Standard Rectifier Module

tentative

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

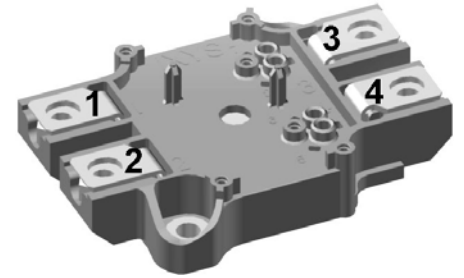
$$I_{FAV} = 200 \text{ A}$$

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

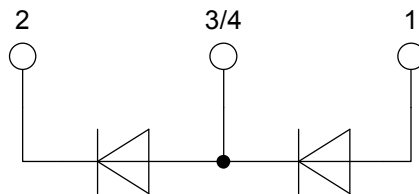
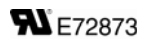
Phase leg

Part number

**MDMA200P1600SA**



Backside: isolated



### 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

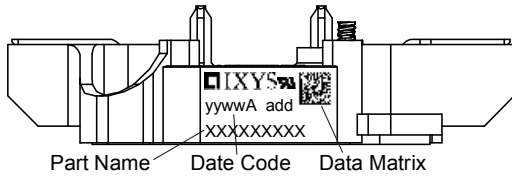
### Package:

- Housing: SimBus A
- International standard package
- RoHS compliant
- Isolation voltage: 4800 V~
- Advanced power cycling

Rectifier			Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit
$V_{RSM}$	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, drain current	$V_R = 1600\text{ V}$	$T_{VJ} = 25^{\circ}\text{C}$		200	$\mu\text{A}$
		$V_R = 1600\text{ V}$	$T_{VJ} = 125^{\circ}\text{C}$		5	mA
$V_F$	forward voltage drop	$I_F = 200\text{ A}$	$T_{VJ} = 25^{\circ}\text{C}$		1.13	V
		$I_F = 400\text{ A}$			1.33	V
		$I_F = 200\text{ A}$	$T_{VJ} = 125^{\circ}\text{C}$		1.06	V
		$I_F = 400\text{ A}$			1.32	V
$I_{FAV}$	average forward current	$T_C = 100^{\circ}\text{C}$ 180° sine	$T_{VJ} = 150^{\circ}\text{C}$		200	A
$V_{FO}$	threshold voltage	} for power loss calculation only	$T_{VJ} = 150^{\circ}\text{C}$		0.95	V
$r_F$	slope resistance				0.96	m $\Omega$
$R_{thJC}$	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	$t = 10\text{ ms; (50 Hz), sine}$	$T_{VJ} = 45^{\circ}\text{C}$		6.00	kA
		$t = 8,3\text{ ms; (60 Hz), sine}$	$V_R = 0\text{ V}$		6.48	kA
		$t = 10\text{ ms; (50 Hz), sine}$	$T_{VJ} = 150^{\circ}\text{C}$		5.10	kA
		$t = 8,3\text{ ms; (60 Hz), sine}$	$V_R = 0\text{ V}$		5.51	kA
$I^2t$	value for fusing	$t = 10\text{ ms; (50 Hz), sine}$	$T_{VJ} = 45^{\circ}\text{C}$		180.0	kA <sup>2</sup> s
		$t = 8,3\text{ ms; (60 Hz), sine}$	$V_R = 0\text{ V}$		174.7	kA <sup>2</sup> s
		$t = 10\text{ ms; (50 Hz), sine}$	$T_{VJ} = 150^{\circ}\text{C}$		130.1	kA <sup>2</sup> s
		$t = 8,3\text{ ms; (60 Hz), sine}$	$V_R = 0\text{ V}$		126.3	kA <sup>2</sup> s
$C_J$	junction capacitance	$V_R = 400\text{ V}$ $f = 1\text{ MHz}$	$T_{VJ} = 25^{\circ}\text{C}$		273	pF

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Package SimBus A		Ratings				
Symbol	Definition	Conditions	min.	typ.	max.	Unit
$I_{RMS}$	RMS current	per terminal			300	A
$T_{stg}$	storage temperature		-40		125	°C
$T_{VJ}$	virtual junction temperature		-40		150	°C
<b>Weight</b>				152		g
$M_D$	mounting torque		3		5	Nm
$M_T$	terminal torque		2.5		5	Nm
$V_{ISOL}$	isolation voltage	t = 1 second	4800			V
		t = 1 minute				4000
$d_{Spp/App}$	creepage distance on surface   striking distance through air	terminal to terminal	14.0	10.0		mm
$d_{Spb/App}$		terminal to backside	14.0	10.0		mm

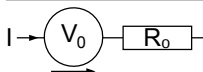

**Part number**

- 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

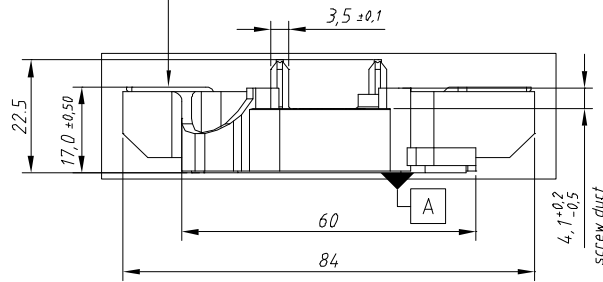
 $T_{VJ} = 150^{\circ}\text{C}$ 

**Rectifier**

$V_{0\max}$	threshold voltage	0.95	V
$R_{0\max}$	slope resistance *	0.16	mΩ

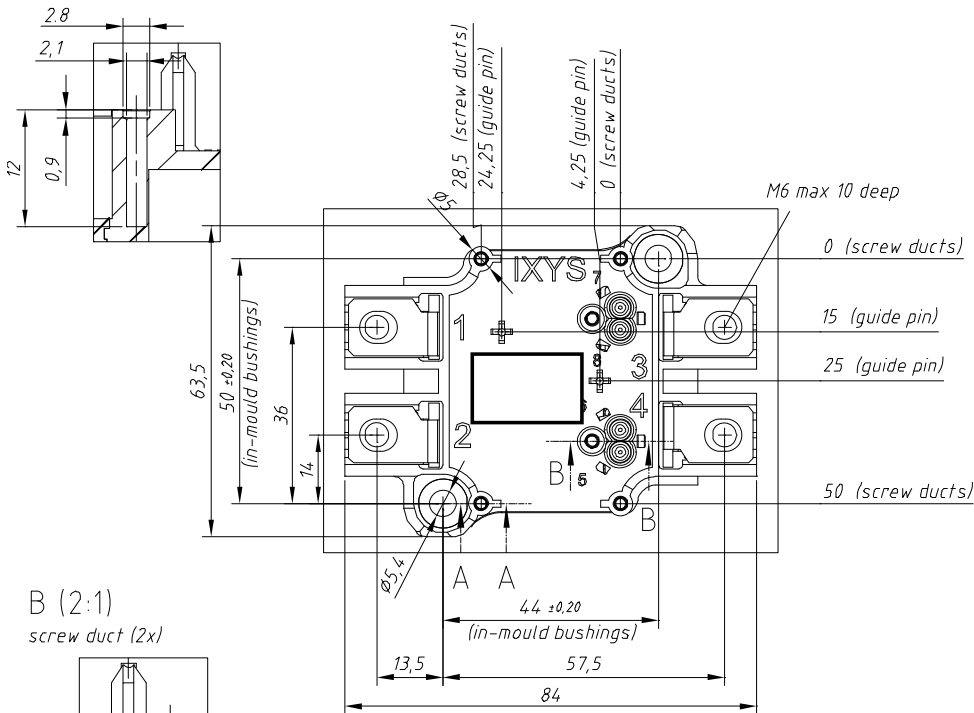
## Outlines SimBus A

general tolerance:  
ISO 2768-mK

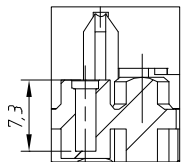
	0,3	main terminal
	0,2	A



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  $\pm 0,1$

