# Excellent Integrated System Limited

Stocking Distributor

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IXYS Corporation
MDMA200P1600SA

For any questions, you can email us directly:
sales@integrated-circuit.com

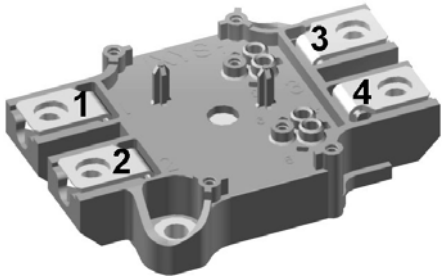
# Standard Rectifier Module

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

Phase leg

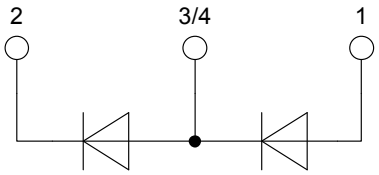
**Part number**

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

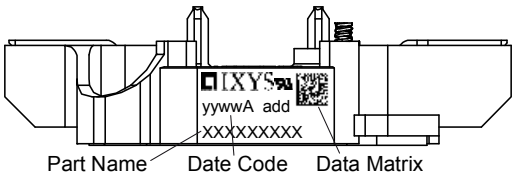
- Isolation Voltage: 4800 V~
- Industry standard outline
- RoHS compliant
- Gate: Spring contacts for solder-free PCB-mounting
- Height: 17 mm
- Base plate: Copper internally DCB isolated
- Advanced power cycling

## Rectifier

| Symbol | Definition | Conditions | | Ratings 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 |

# IXYS MDMA200P1600SA

| 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 |



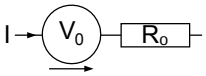

**Part number**

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

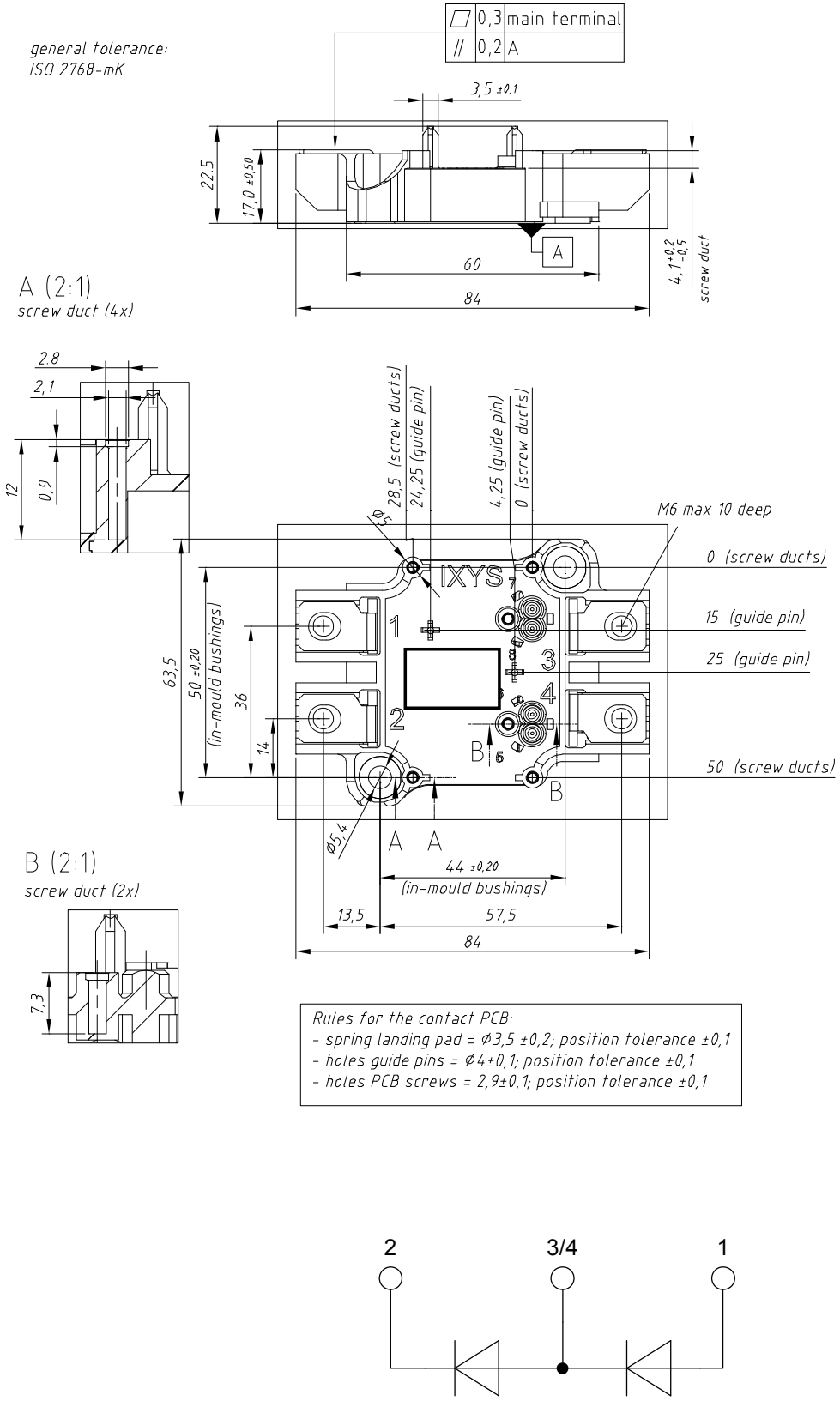
** on die level* $T_{VJ}$ = 150 °C




**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

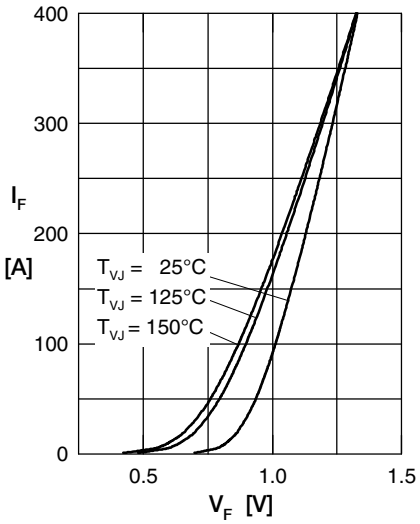



Fig. 1 Forward current versus voltage drop per diode

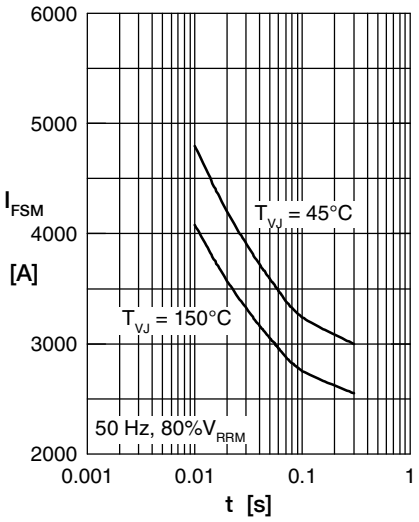



Fig. 2 Surge overload current vs. time per diode

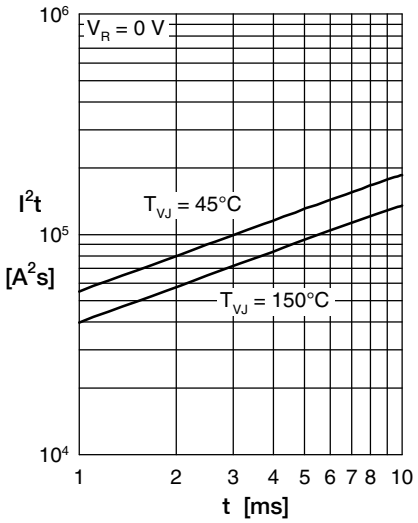



Fig. 3 $I^2t$ versus time per diode

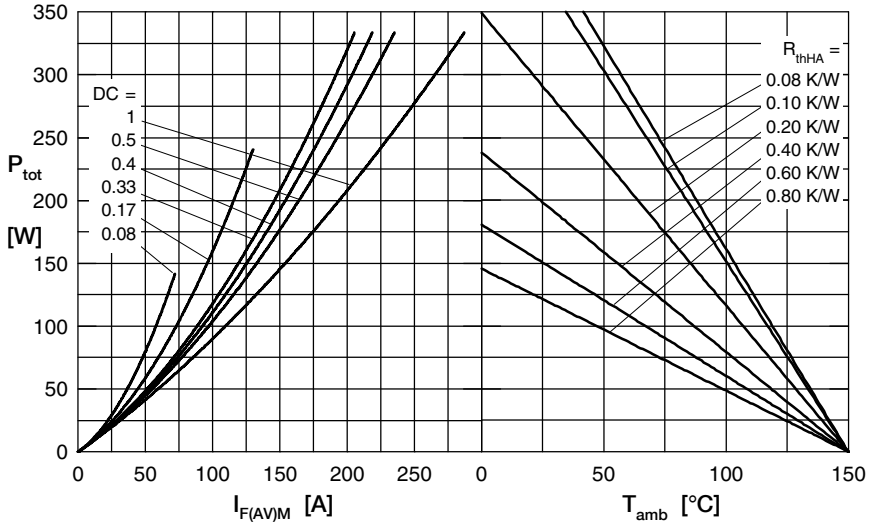



Fig. 4 Power dissipation vs. forward current and ambient temperature per diode

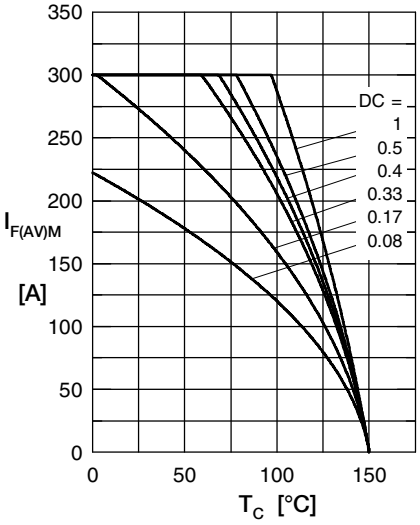



Fig. 5 Max. forward current vs. case temperature per diode

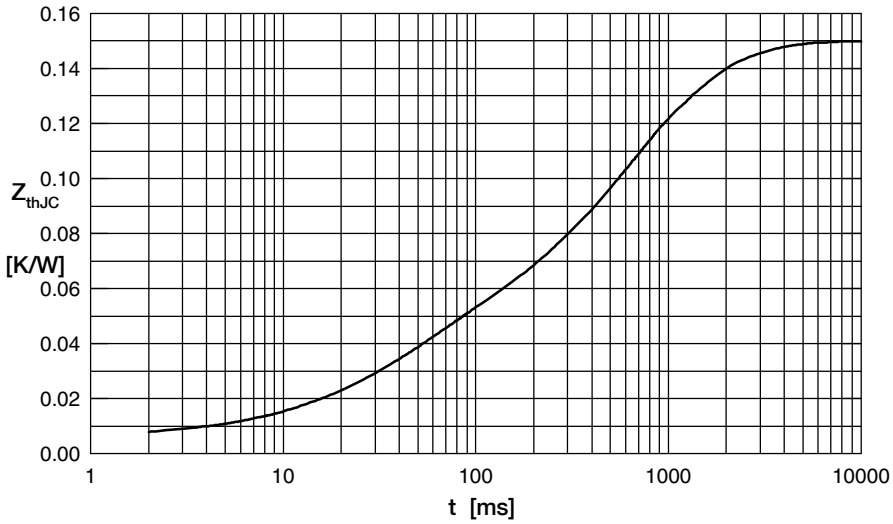



Fig. 6 Transient thermal impedance junction to case vs. time per diode

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 |