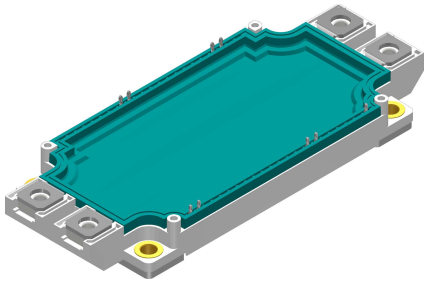
Standard Rectifier Module

V_{RRM} = 2x 1600 V
I_{FAV} = 425 A
V_F = 1.21 V

Phase leg + NTC

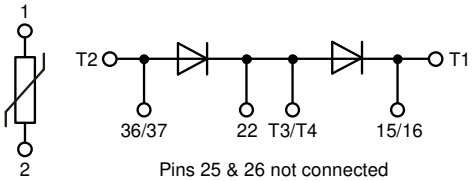
Part number

MDMA425P1600PTSF



Backside: isolated

E72873



Pins 25 & 26 not connected

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

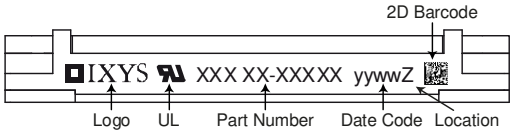
Package: SimBus F

- Isolation Voltage: 4300 V~
- Industry standard outline
- RoHS compliant
- PressFit-Pins for PCB mounting
- Height: 17 mm
- Base plate: Copper internally DCB isolated
- Advanced power cycling
- Phase Change Material available

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			300	µA
		V_R = 1600 V	T_{VJ} = 150°C			8	mA
V_F	*forward voltage drop*	I_F = 425 A	T_{VJ} = 25°C			1.29	V
		I_F = 850 A				1.65	V
		I_F = 425 A	T_{VJ} = 125°C			1.21	V
		I_F = 850 A				1.64	V
I_{FAV}	*average forward current*	T_C = 100°C	T_{VJ} = 150°C			425	A
		rectangular d = 0.5					
V_{F0}	*threshold voltage* } *for power loss calculation only*		T_{VJ} = 150°C			0.77	V
r_F	*slope resistance* }					1.01	mΩ
R_{thJC}	*thermal resistance junction to case*					0.07	K/W
R_{thCH}	*thermal resistance case to heatsink*				0.04		K/W
P_{tot}	*total power dissipation*		T_C = 25°C			1785	W
I_{FSM}	*max. forward surge current*	t = 10 ms; (50 Hz), sine	T_{VJ} = 45°C			10.0	kA
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			10.8	kA
		t = 10 ms; (50 Hz), sine	T_{VJ} = 150°C			8.50	kA
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			9.18	kA
I^2t	*value for fusing*	t = 10 ms; (50 Hz), sine	T_{VJ} = 45°C			500.0	kA²s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			485.2	kA²s
		t = 10 ms; (50 Hz), sine	T_{VJ} = 150°C			361.3	kA²s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			350.6	kA²s
C_J	*junction capacitance*	V_R = 400 V; f = 1 MHz	T_{VJ} = 25°C		661		pF

Package SimBus F					Ratings			
Symbol	Definition	Conditions			min.	typ.	max.	Unit
I_{RMS}	*RMS current*	per terminal					tbd	A
T_{VJ}	*virtual junction temperature*				-40		175	°C
T_{op}	*operation temperature*				-40		150	°C
T_{stg}	*storage temperature*				-40		125	°C
Weight						350		g
M_D	*mounting torque*				3		6	Nm
M_T	*terminal torque*				3		6	Nm
$d_{Spp/App}$	*creepage distance on surface | striking distance through air*		*terminal to terminal*	13.3	10.0			mm
$d_{Spb/Apb}$			*terminal to backside*	10.2	10.2			mm
V_{ISOL}	*isolation voltage*	t = 1 second	50/60 Hz, RMS; I_{ISOL} ≤ 1 mA		4300			V
		t = 1 minute			3600			V



Part description

M = Module
D = Diode
M = Standard Rectifier
A = (up to 1800V)
425 = Current Rating [A]
P = Phase leg
1600 = Reverse Voltage [V]
PT = PressFit-Pin, Thermistor
SF = SimBus F
- = Hyphen
PC = Phase Change Material

Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	MDMA425P1600PTSF	MDMA425P1600PTSF	Blister	24	519078
Alternative	MDMA425P1600PTSF-PC	MDMA425P1600PTSF	Blister	24	519057

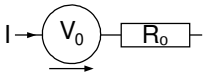
Similar Part	Package	Voltage class
MDMA300P1600PTSF	SimBus F	1600
MDMA600P1600PTSF	SimBus F	1600
MDNA300P2200PTSF	SimBus F	2200
MDNA600P2200PTSF	SimBus F	2200

Temperature Sensor NTC

Symbol	Definition	Conditions	min.	typ.	max.	Unit
R_{25}	*resistance*	T_{VJ} = 25°	4.85	5	5.15	kΩ
$B_{25/50}$	*temperature coefficient*			3375		K

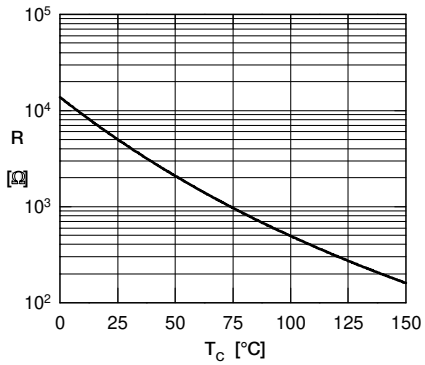
Equivalent Circuits for Simulation

** on die level* T_{VJ} = 150°C



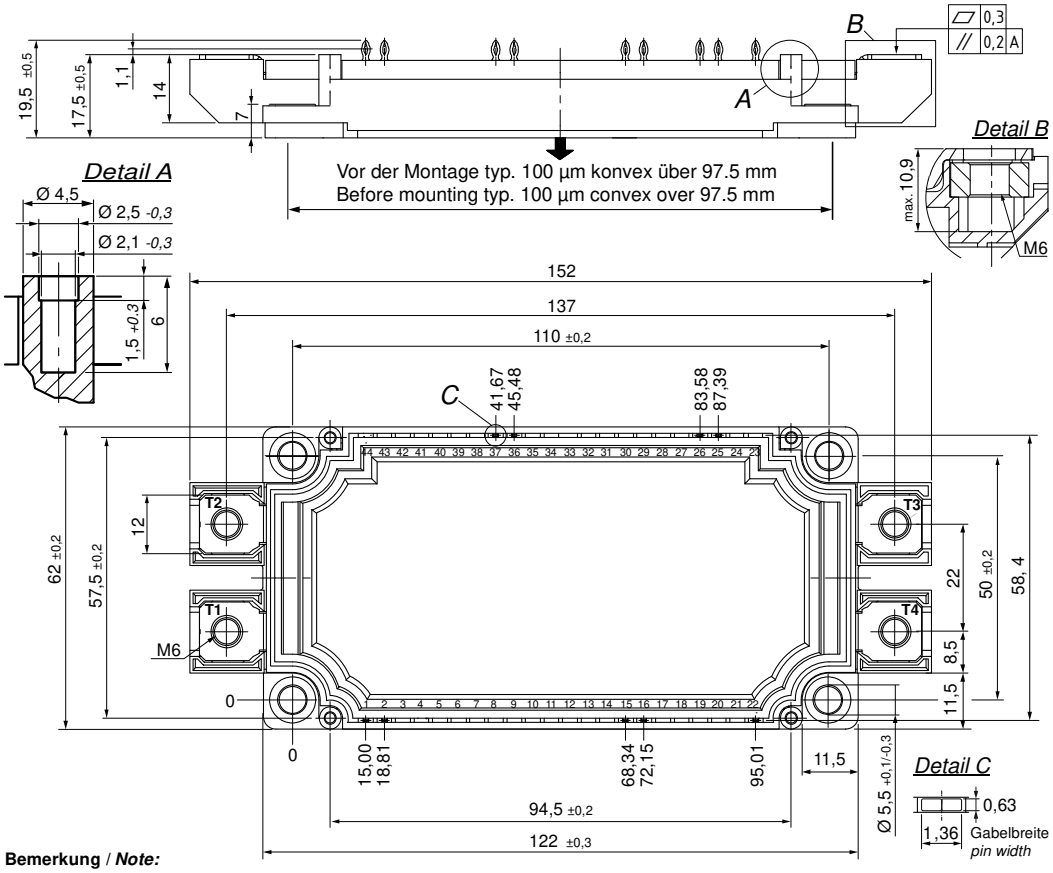
Rectifier

$V_{0\,max}$	*threshold voltage*	0.77	V
$R_{0\,max}$	*slope resistance **	0.29	mΩ



Typ. NTC resistance vs. temperature

Outlines SimBus F

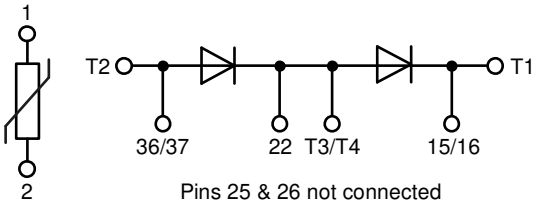


Bemerkung / ***Note:***

- Nichttolerierte Maße nach / Measure w/o tolerances acc. DIN ISO 2768-T1-m
- PCB-Lochmuster / PCB hole pattern: see pin position
- Toleranz Pin-Position und PCB-Lochmuster / Tolerance of pin position and PCB hole pattern: ⌖ 0.1
- Bohrlochdurchmesser / Diameter of drill: Ø 1.16 mm
- Endlochdurchmesser / Diameter of plated holes: Ø 1.00 - 1.10 mm (Cu thickness in via typ. 50 µm)
- Beschichtung / Plating: chem. Sn max. 15 µm
- Einpresskraft / Insert Force: per terminal with a typ. insert speed of 1 mm/s: typ. 90 N
- Weitere Angaben / Further information: www.ixys.com Application note IXAN0077
- Montageanleitung / Mounting instruction: www.ixys.com Application note IXAN0024

Detail A: PCB-Montage / *Mounting on PCB*

- Empfohlene, selbstschneidende Schraube / *Recommended, self-tapping screw:* **EJOT PT®** (Größe / *size:* **K25**)
- Max. Schraubenlänge / *Max. screw length:* **PCB-Dicke** / **thickness + 6 mm** *(*max. Lochtiefe / *hole depth)*
- Empfohlenes Drehmoment / *Recommended mounting torque:* **1.5 Nm**



Pins 25 & 26 not connected

Rectifier

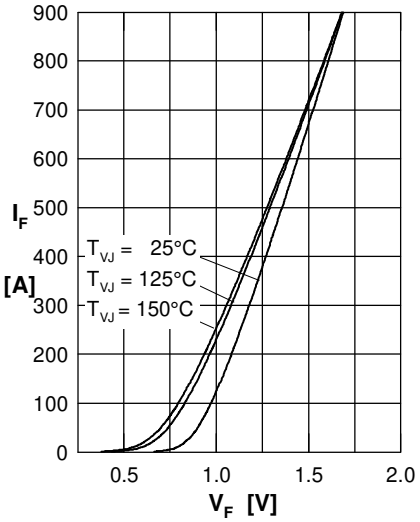


Fig. 1 Forward current versus voltage drop per diode

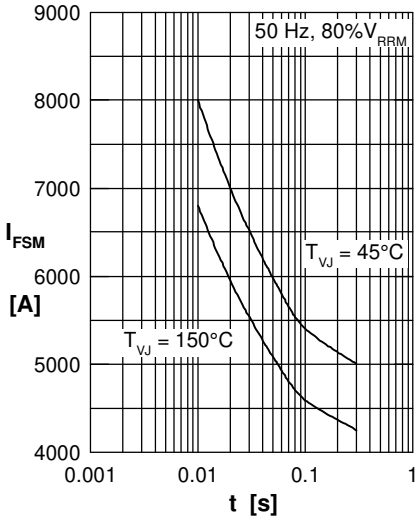


Fig. 2 Surge overload current vs. time per diode

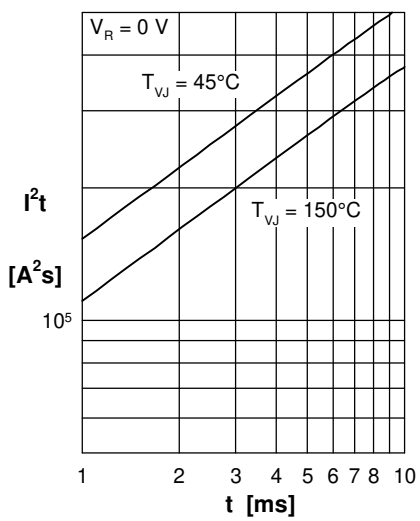


Fig. 3 I^2t versus time per diode

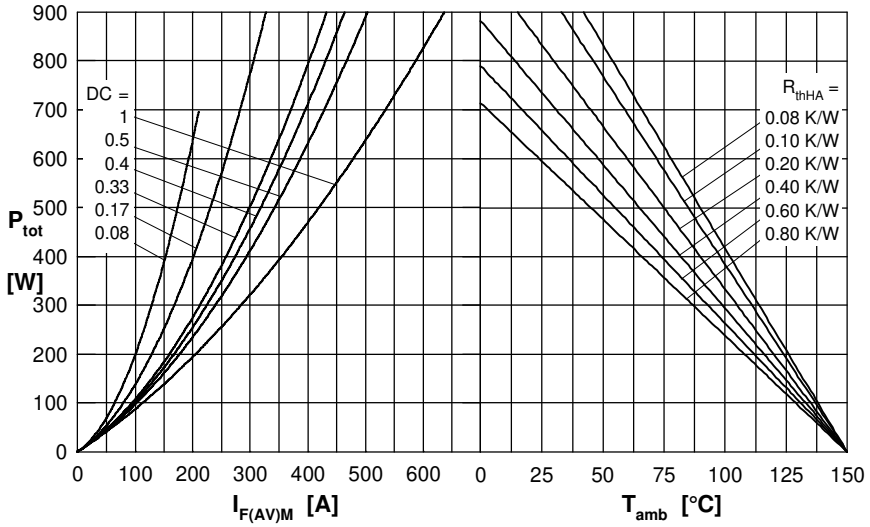


Fig. 4 Power dissipation vs. forward current and ambient temperature per diode

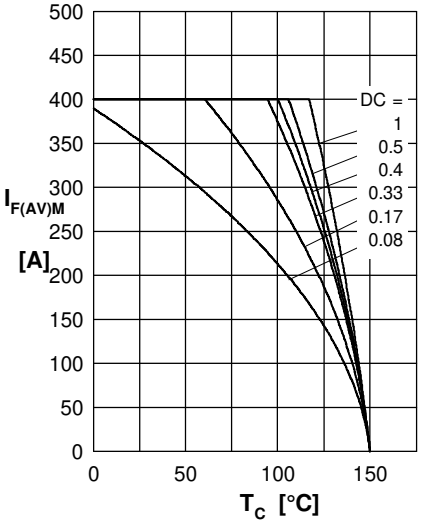


Fig. 5 Max. forward current vs. case temperature per diode

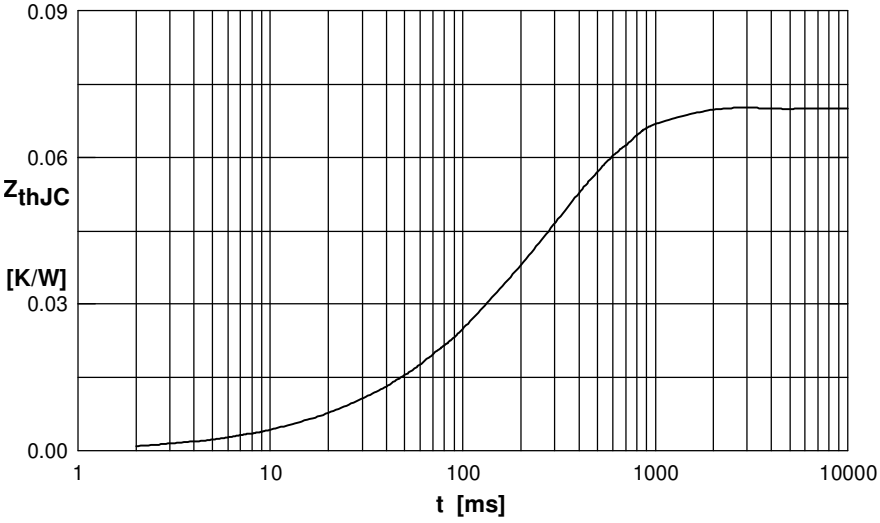


Fig. 6 Transient thermal impedance junction to case vs. time per diode

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.003	0.0150
2	0.009	0.0800
3	0.016	0.2200
4	0.042	0.3800