

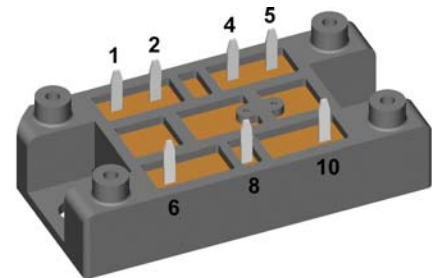
Standard Rectifier Module

3~ Rectifier	
V_{RRM}	= 1600 V
I_{DAV}	= 30 A
I_{FSM}	= 150 A

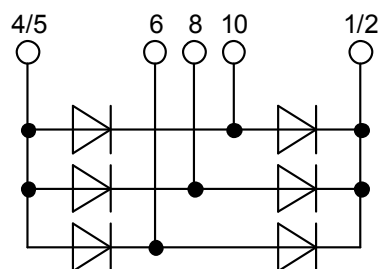
3~ Rectifier Bridge

Part number

VUO22-16NO1



 E72873



Features / Advantages:

- Package with DCB ceramic
- Reduced weight
- Improved temperature and power cycling
- Planar passivated chips
- Very low forward voltage drop
- Very low leakage current

Applications:

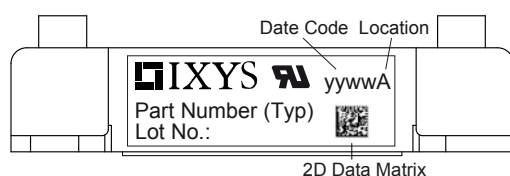
- Diode for main rectification
- For three phase bridge configurations
- Supplies for DC power equipment
- Input rectifiers for PWM inverter
- Battery DC power supplies
- Field supply for DC motors

Package: V1-A-Pack

- Isolation Voltage: 3600 V~
- Industry standard outline
- RoHS compliant
- Soldering pins for PCB mounting
- Height: 17 mm
- Base plate: DCB ceramic
- Reduced weight
- 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	$V_R = 1600\text{ V}$	$T_{VJ} = 25^{\circ}\text{C}$			10	μA
		$V_R = 1600\text{ V}$	$T_{VJ} = 150^{\circ}\text{C}$			0.7	mA
V_F	forward voltage drop	$I_F = 10\text{ A}$	$T_{VJ} = 25^{\circ}\text{C}$			1.19	V
		$I_F = 30\text{ A}$				1.59	V
		$I_F = 10\text{ A}$	$T_{VJ} = 125^{\circ}\text{C}$			1.13	V
		$I_F = 30\text{ A}$				1.66	V
I_{DAV}	bridge output current	$T_C = 110^{\circ}\text{C}$ rectangular $d = \frac{1}{3}$	$T_{VJ} = 150^{\circ}\text{C}$			30	A
V_{FO}	threshold voltage	} for power loss calculation only		$T_{VJ} = 150^{\circ}\text{C}$		0.84	V
r_F	slope resistance					28	m Ω
R_{thJC}	thermal resistance junction to case					2.5	K/W
R_{thCH}	thermal resistance case to heatsink				0.4		K/W
P_{tot}	total power dissipation	$T_C = 25^{\circ}\text{C}$				50	W
I_{FSM}	max. forward surge current	$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}$	$T_{VJ} = 45^{\circ}\text{C}$			150	A
		$t = 8,3\text{ ms}; (60\text{ Hz}), \text{ sine}$	$V_R = 0\text{ V}$			160	A
		$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}$	$T_{VJ} = 150^{\circ}\text{C}$			130	A
		$t = 8,3\text{ ms}; (60\text{ Hz}), \text{ sine}$	$V_R = 0\text{ V}$			140	A
I^2t	value for fusing	$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}$	$T_{VJ} = 45^{\circ}\text{C}$			115	A ² s
		$t = 8,3\text{ ms}; (60\text{ Hz}), \text{ sine}$	$V_R = 0\text{ V}$			105	A ² s
		$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}$	$T_{VJ} = 150^{\circ}\text{C}$			85	A ² s
		$t = 8,3\text{ ms}; (60\text{ Hz}), \text{ sine}$	$V_R = 0\text{ V}$			82	A ² s
C_J	junction capacitance	$V_R = 400\text{ V}; f = 1\text{ MHz}$			4		pF

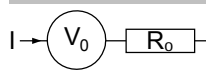
Package V1-A-Pack				Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit	
I_{RMS}	RMS current	per terminal			100	A	
T_{stg}	storage temperature		-40		125	°C	
T_{VJ}	virtual junction temperature		-40		150	°C	
Weight				37		g	
M_D	mounting torque		2		2.5	Nm	
$d_{Spp/App}$	creepage distance on surface striking distance through air	terminal to terminal	6.0			mm	
$d_{Spb/Apb}$		terminal to backside	12.0			mm	
V_{ISOL}	isolation voltage	t = 1 second	3600			V	
		t = 1 minute	3000			V	



Ordering	Part Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	VUO22-16NO1	VUO22-16NO1	Box	10	461091

Equivalent Circuits for Simulation

* on die level

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

Rectifier

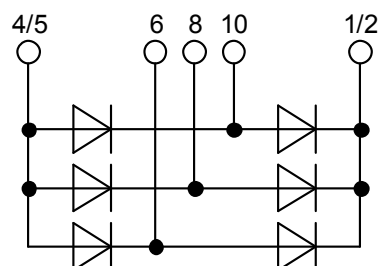
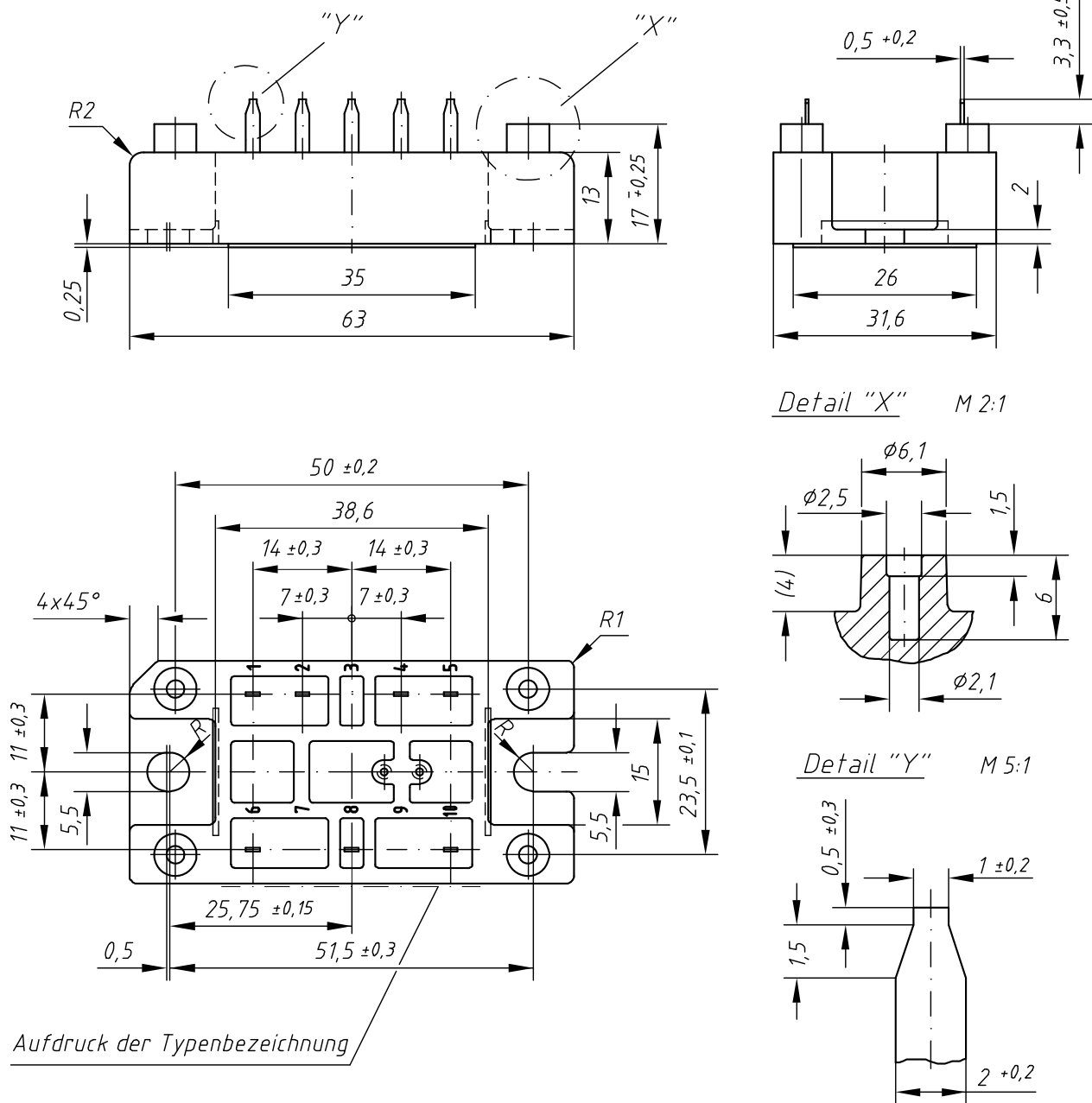
 $V_{0\max}$ threshold voltage 0.84

V

 $R_{0\max}$ slope resistance * 27

mΩ

Outlines V1-A-Pack



Rectifier

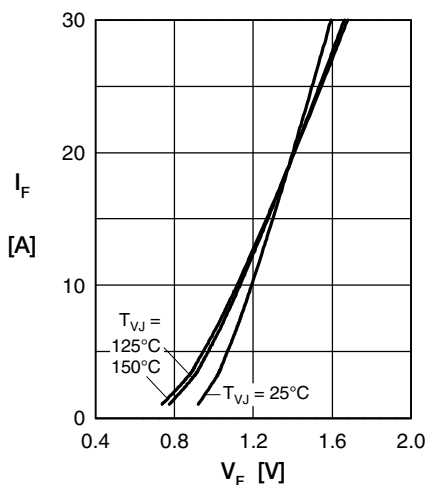


Fig. 1 Forward current vs. voltage drop per diode

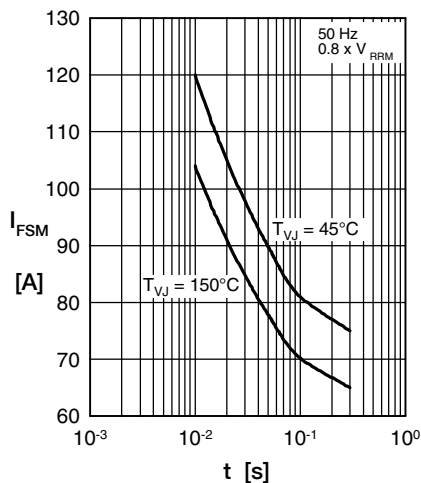


Fig. 2 Surge overload current vs. time per diode

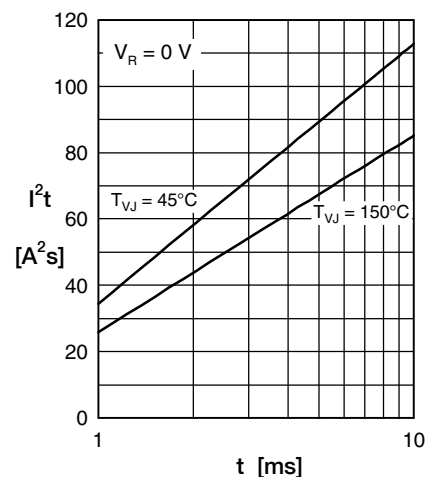


Fig. 3 I^2t vs. time per diode

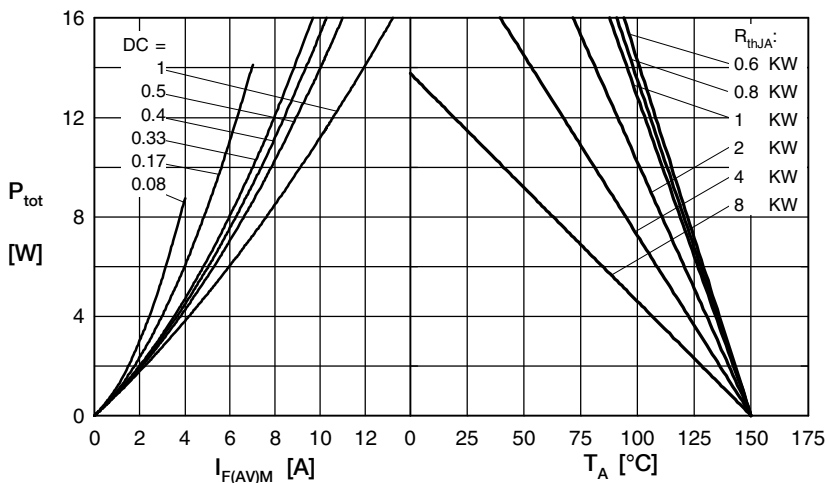


Fig. 4 Power dissipation vs. forward current and ambient temperature per diode

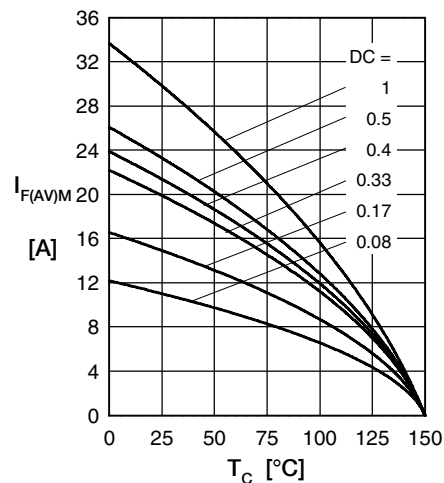


Fig. 5 Max. forward current vs. case temperature per diode

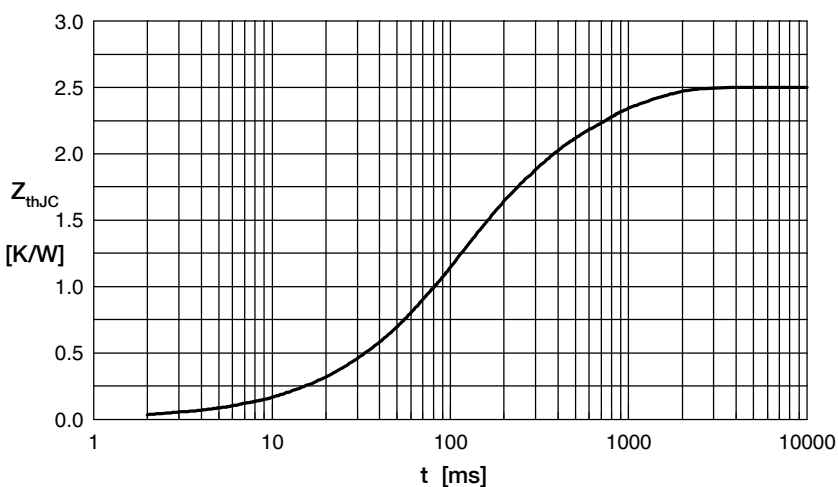


Fig. 6 Transient thermal impedance junction to case vs. time per diode

Constants for Z_{thJC} calculation:

i	R_{th} (K/W)	t_i (s)
1	1.300	0.1015
2	0.300	0.1026
3	0.350	0.4919
4	0.550	0.6200

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