

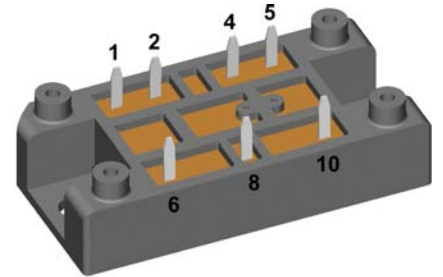
# Standard Rectifier Module

<b>3~ Rectifier</b>	
$V_{RRM}$	= 1200 V
$I_{DAV}$	= 45 A
$I_{FSM}$	= 300 A

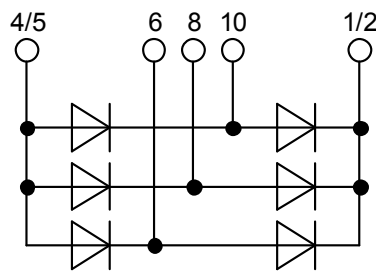
## 3~ Rectifier Bridge

Part number

**VUO34-12NO1**



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:

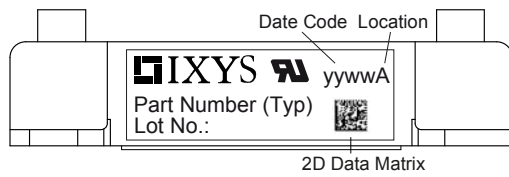
- Diode for main rectification
- For three phase bridge configurations
- Supplies for DC power equipment
- Input rectifiers for PWM inverter
- Battery DC power supplies
- Field supply for DC motors

### Package: V1-A-Pack

- Isolation Voltage: 3600V~
- 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	$T_{VJ} = 25^{\circ}C$			1300	V
$V_{RRM}$	max. repetitive reverse blocking voltage	$T_{VJ} = 25^{\circ}C$			1200	V
$I_R$	reverse current	$V_R = 1200 V$	$T_{VJ} = 25^{\circ}C$		20	$\mu A$
		$V_R = 1200 V$	$T_{VJ} = 150^{\circ}C$		1	mA
$V_F$	forward voltage drop	$I_F = 15 A$	$T_{VJ} = 25^{\circ}C$		1.13	V
		$I_F = 45 A$			1.46	V
		$I_F = 15 A$	$T_{VJ} = 125^{\circ}C$		1.06	V
		$I_F = 45 A$			1.48	V
$I_{DAV}$	bridge output current	$T_C = 110^{\circ}C$ rectangular $d = \frac{1}{3}$	$T_{VJ} = 150^{\circ}C$		45	A
$V_{FO}$	threshold voltage	} for power loss calculation only	$T_{VJ} = 150^{\circ}C$		0.81	V
$r_F$	slope resistance				14.9	m $\Omega$
$R_{thJC}$	thermal resistance junction to case				1.7	K/W
$R_{thCH}$	thermal resistance case to heatsink			0.4		K/W
$P_{tot}$	total power dissipation		$T_C = 25^{\circ}C$		70	W
$I_{FSM}$	max. forward surge current	$t = 10 \text{ ms; (50 Hz), sine}$	$T_{VJ} = 45^{\circ}C$		300	A
		$t = 8,3 \text{ ms; (60 Hz), sine}$	$V_R = 0 V$		325	A
		$t = 10 \text{ ms; (50 Hz), sine}$	$T_{VJ} = 150^{\circ}C$		255	A
		$t = 8,3 \text{ ms; (60 Hz), sine}$	$V_R = 0 V$		275	A
$I^2t$	value for fusing	$t = 10 \text{ ms; (50 Hz), sine}$	$T_{VJ} = 45^{\circ}C$		450	A <sup>2</sup> s
		$t = 8,3 \text{ ms; (60 Hz), sine}$	$V_R = 0 V$		440	A <sup>2</sup> s
		$t = 10 \text{ ms; (50 Hz), sine}$	$T_{VJ} = 150^{\circ}C$		325	A <sup>2</sup> s
		$t = 8,3 \text{ ms; (60 Hz), sine}$	$V_R = 0 V$		315	A <sup>2</sup> s
$C_J$	junction capacitance	$V_R = 400 V; f = 1 \text{ MHz}$	$T_{VJ} = 25^{\circ}C$		11	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
<b>Weight</b>				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	VUO34-12NO1	VUO34-12NO1	Box	10	461121

### Equivalent Circuits for Simulation

\* on die level

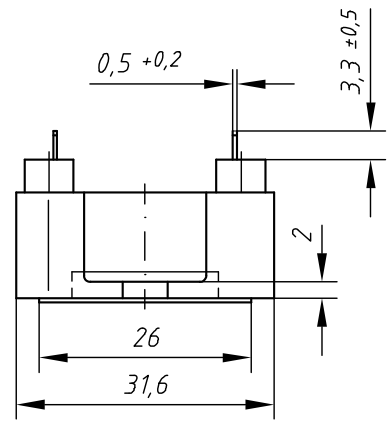
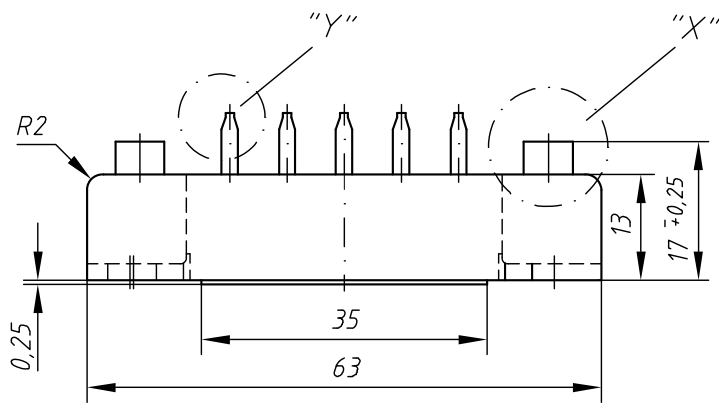
$T_{VJ} = 150\text{ °C}$



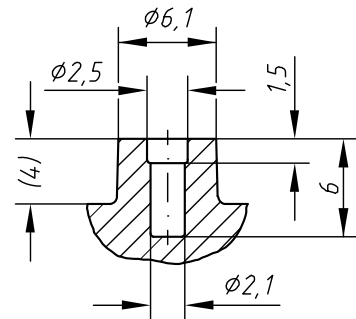
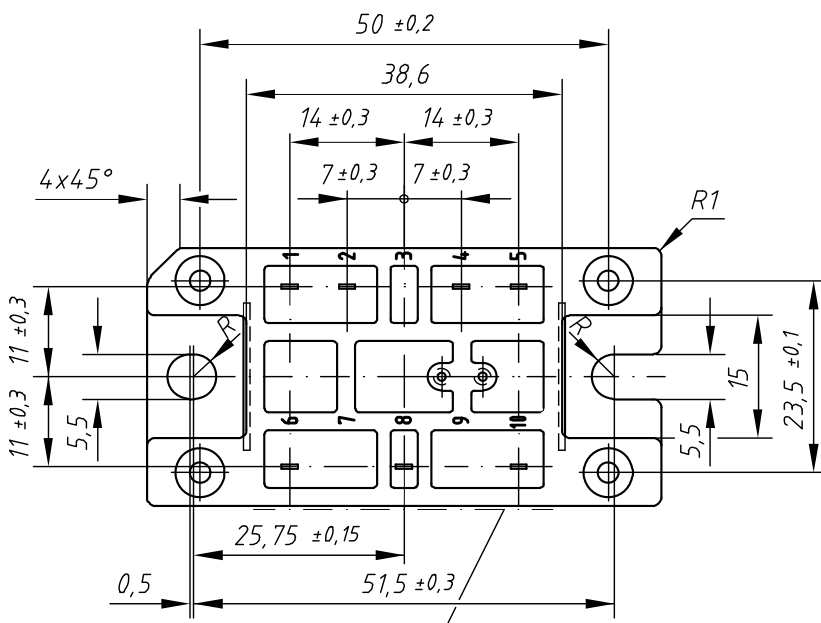
Rectifier

$V_{0\ max}$	threshold voltage	0.81	V
$R_{0\ max}$	slope resistance *	13.7	mΩ

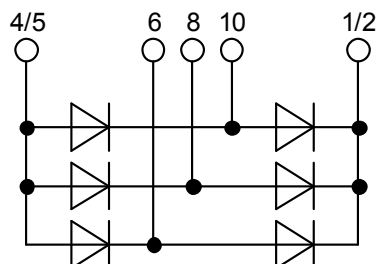
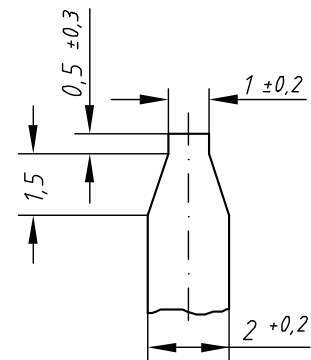
## Outlines V1-A-Pack



Detail "X" M 2:1



Detail "Y" M 5:1



## Rectifier

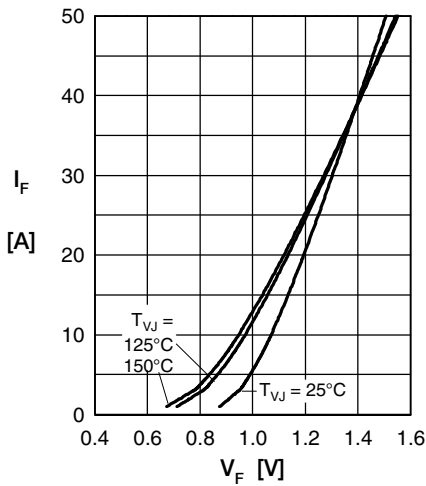


Fig. 1 Forward current vs. voltage drop per diode

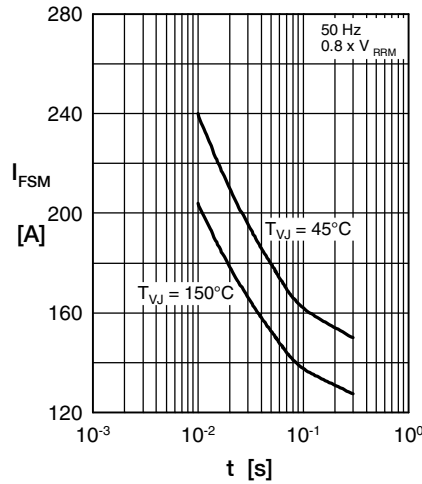


Fig. 2 Surge overload current vs. time per diode

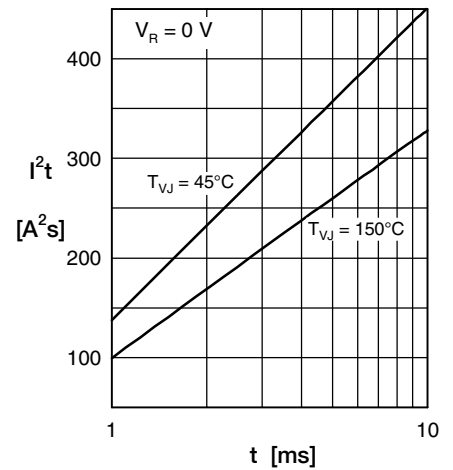


Fig. 3  $I^2t$  vs. time per diode

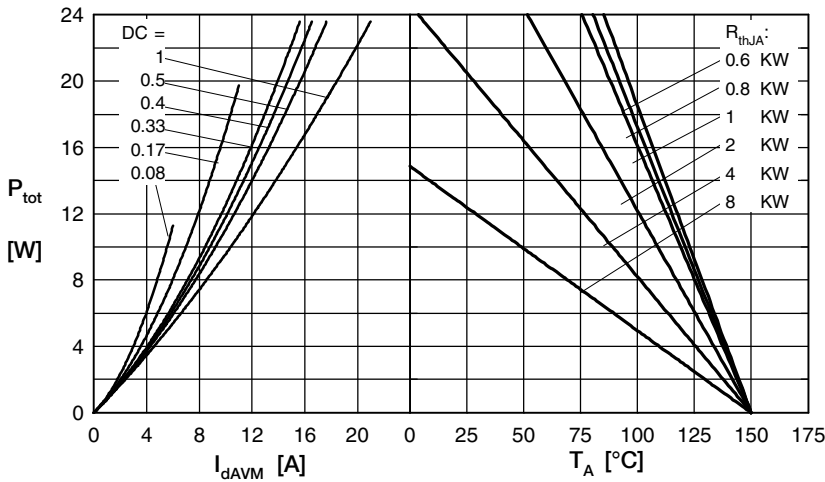


Fig. 4 Power dissipation vs. forward current and ambient temperature per diode

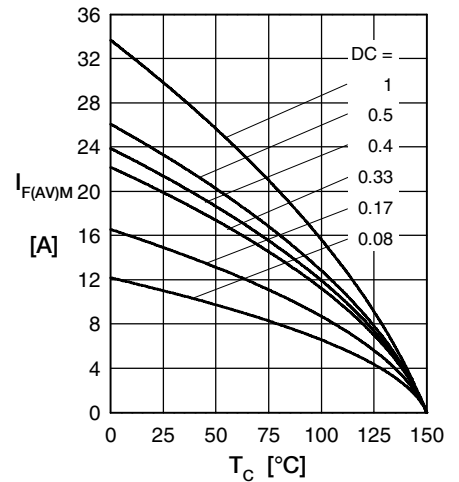


Fig. 5 Max. forward current vs. case temperature per diode

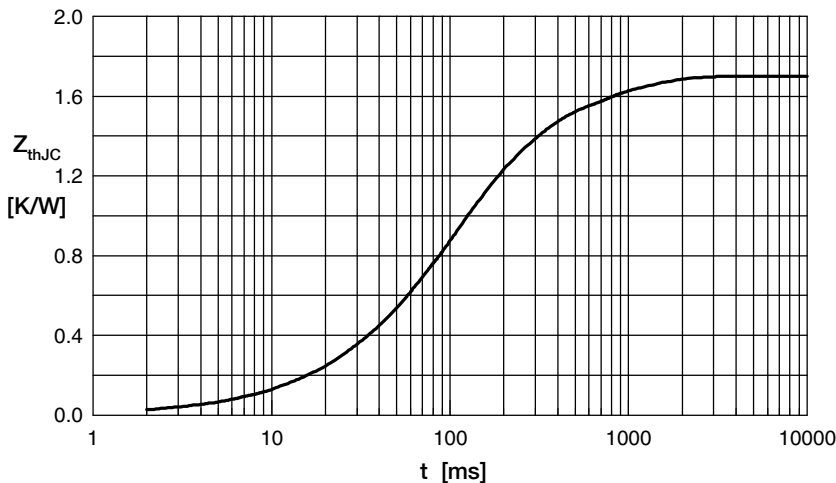


Fig. 6 Transient thermal impedance junction to case vs. time per diode

Constants for  $Z_{thJC}$  calculation:

i	$R_{th}$ (K/W)	$t_i$ (s)
1	1.150	0.1015
2	0.150	0.1026
3	0.100	0.4919
4	0.300	0.6200