

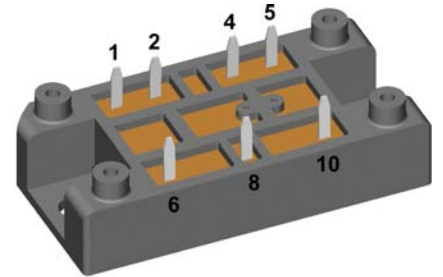
Standard Rectifier Module

3~ Rectifier	
V_{RRM}	= 1800 V
I_{DAV}	= 60 A
I_{FSM}	= 350 A

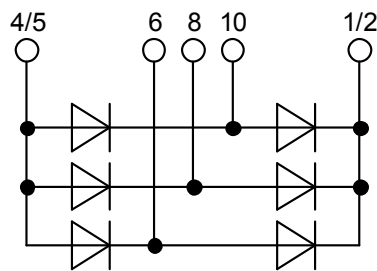
3~ Rectifier Bridge

Part number

VUO52-18NO1



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:

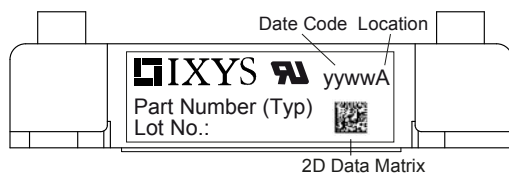
- Diode for main rectification
- For three phase bridge configurations
- Supplies for DC power equipment
- Input rectifiers for PWM inverter
- Battery DC power supplies
- Field supply for DC motors

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	$T_{VJ} = 25^{\circ}C$			1900	V
V_{RRM}	max. repetitive reverse blocking voltage	$T_{VJ} = 25^{\circ}C$			1800	V
I_R	reverse current, drain current	$V_R = 1800 V$	$T_{VJ} = 25^{\circ}C$		40	μA
		$V_R = 1800 V$	$T_{VJ} = 150^{\circ}C$		1.5	mA
V_F	forward voltage drop	$I_F = 20 A$	$T_{VJ} = 25^{\circ}C$		1.13	V
		$I_F = 60 A$			1.44	V
		$I_F = 20 A$	$T_{VJ} = 125^{\circ}C$		1.07	V
		$I_F = 60 A$			1.50	V
I_{DAV}	bridge output current	$T_C = 110^{\circ}C$ rectangular $d = \frac{1}{3}$	$T_{VJ} = 150^{\circ}C$		60	A
V_{FO}	threshold voltage	} for power loss calculation only	$T_{VJ} = 150^{\circ}C$		0.83	V
r_F	slope resistance				11.5	m Ω
R_{thJC}	thermal resistance junction to case				1.3	K/W
R_{thCH}	thermal resistance case to heatsink			0.3		K/W
P_{tot}	total power dissipation		$T_C = 25^{\circ}C$		95	W
I_{FSM}	max. forward surge current	$t = 10 \text{ ms; (50 Hz), sine}$	$T_{VJ} = 45^{\circ}C$		350	A
		$t = 8,3 \text{ ms; (60 Hz), sine}$	$V_R = 0 V$		380	A
		$t = 10 \text{ ms; (50 Hz), sine}$	$T_{VJ} = 150^{\circ}C$		300	A
		$t = 8,3 \text{ ms; (60 Hz), sine}$	$V_R = 0 V$		320	A
I^2t	value for fusing	$t = 10 \text{ ms; (50 Hz), sine}$	$T_{VJ} = 45^{\circ}C$		615	A ² s
		$t = 8,3 \text{ ms; (60 Hz), sine}$	$V_R = 0 V$		600	A ² s
		$t = 10 \text{ ms; (50 Hz), sine}$	$T_{VJ} = 150^{\circ}C$		450	A ² s
		$t = 8,3 \text{ ms; (60 Hz), sine}$	$V_R = 0 V$		425	A ² s
C_J	junction capacitance	$V_R = 400 V; f = 1 \text{ MHz}$	$T_{VJ} = 25^{\circ}C$		10	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 50/60 Hz, RMS; $I_{ISOL} \leq 1$ mA	3000			V



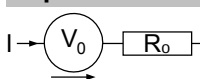
Ordering	Part Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	VUO52-18NO1	VUO52-18NO1	Box	10	461199

Similar Part	Package	Voltage class
VUO52-08NO1	V1-A-Pack	800
VUO52-12NO1	V1-A-Pack	1200
VUO52-14NO1	V1-A-Pack	1400
VUO52-16NO1	V1-A-Pack	1600
VUO52-20NO1	V1-A-Pack	2000
VUO52-22NO1	V1-A-Pack	2200
VUO34-16NO1	V1-A-Pack	1600
VUO34-18NO1	V1-A-Pack	1800

Equivalent Circuits for Simulation

* on die level

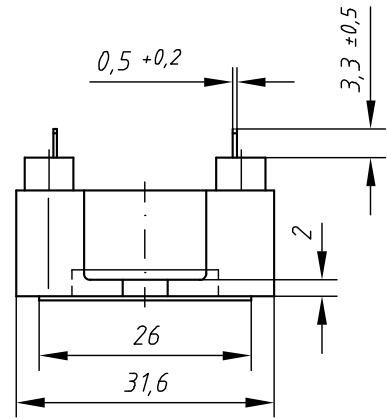
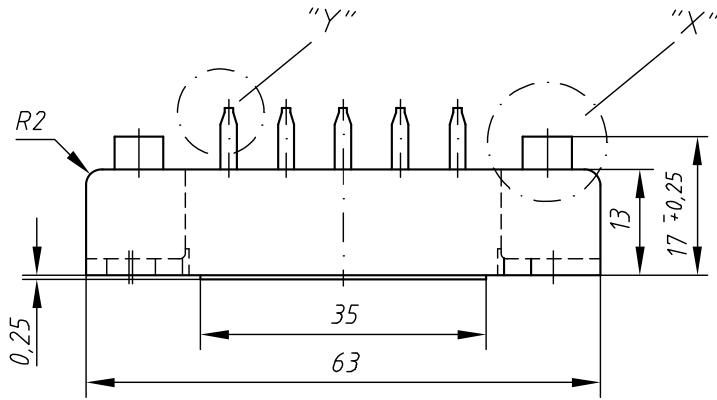
$T_{vj} = 150^\circ\text{C}$



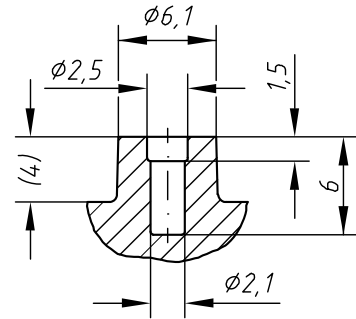
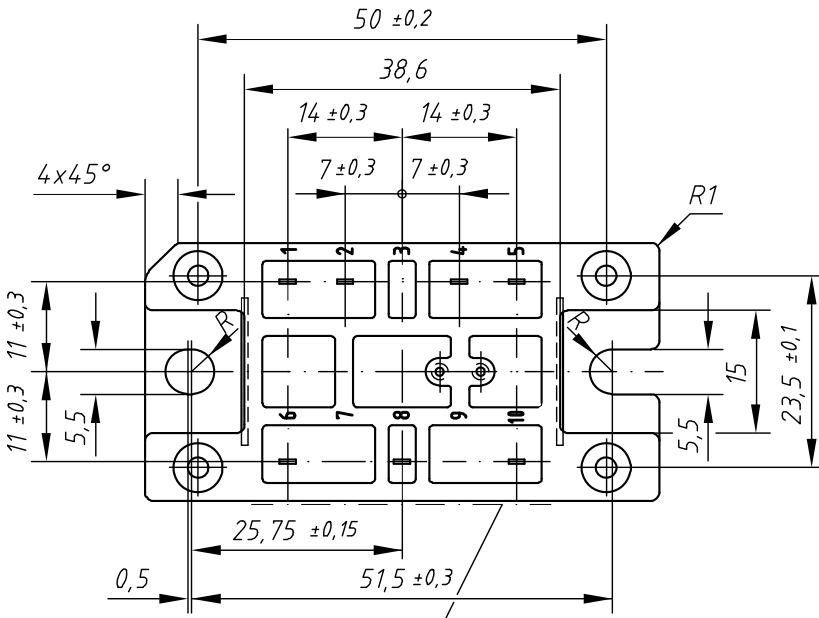
Rectifier

$V_{0\ max}$	threshold voltage	0.83	V
$R_{0\ max}$	slope resistance *	10.2	mΩ

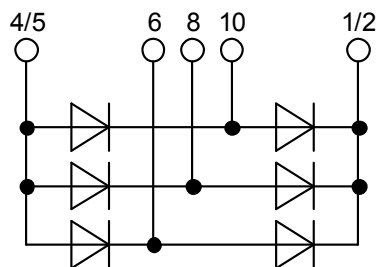
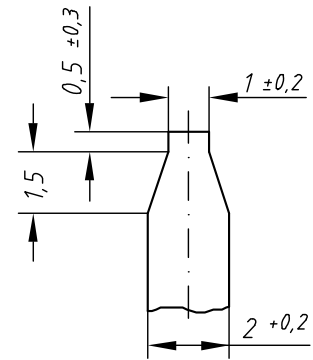
Outlines V1-A-Pack



Detail "X" M 2:1



Detail "Y" M 5:1



Rectifier

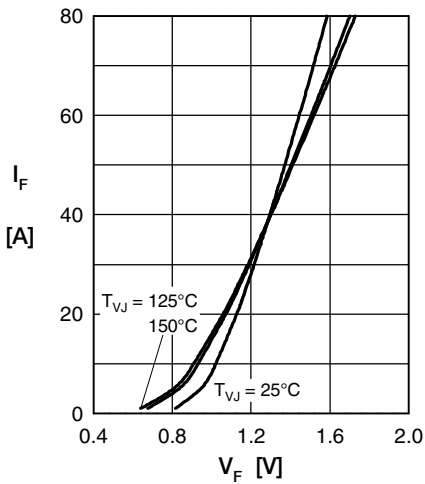


Fig. 1 Forward current versus voltage drop per diode

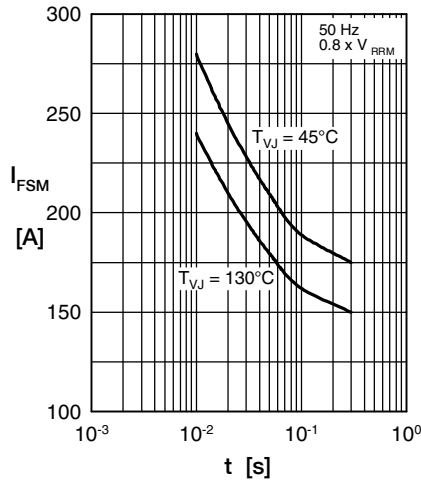


Fig. 2 Surge overload current

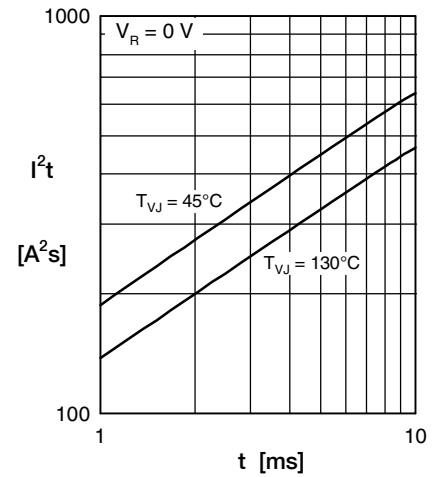


Fig. 3 I^2t versus time per diode

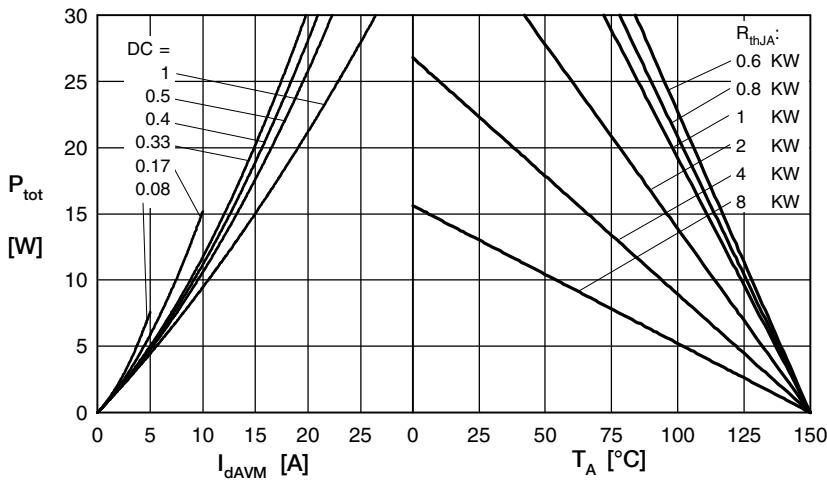


Fig. 4 Power dissipation vs. direct output current & ambient temperature

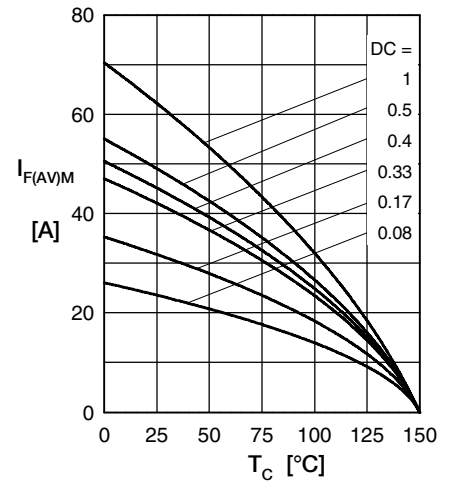


Fig. 5 Max. forward current vs. case temperature

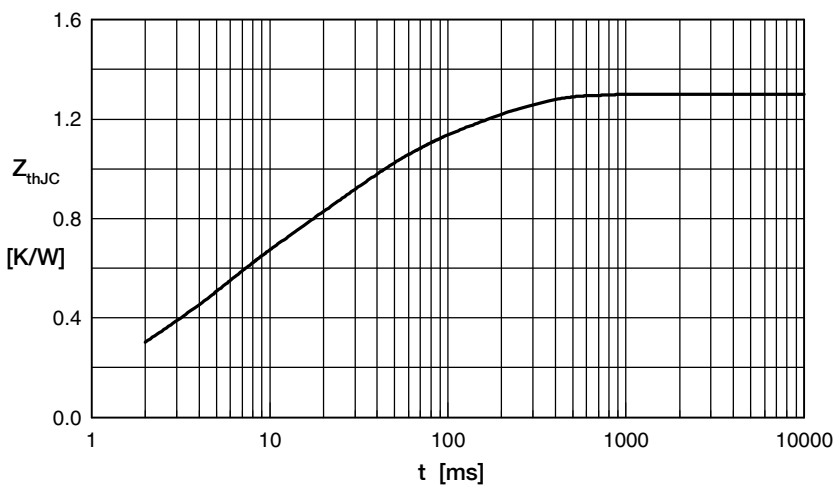


Fig. 6 Transient thermal impedance junction to case

Constants for Z_{thJC} calculation:

i	R_{th} (K/W)	t_i (s)
1	0.06070	0.008
2	0.173	0.05
3	0.3005	0.06
4	0.463	0.3
5	0.3028	0.15