

# Standard Rectifier Module


1~ Rectifier	
$V_{RRM}$	= 1200 V
$I_{DAV}$	= 70 A
$I_{FSM}$	= 750 A

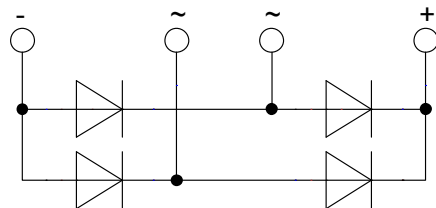
## 1~ Rectifier Bridge

Part number

VBO72-12N07



 E72873



### Features / Advantages:

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

### Applications:

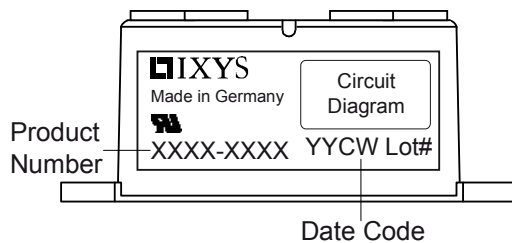
- Diode for main rectification
- For one phase bridge configurations
- Supplies for DC power equipment
- Input rectifiers for PWM inverter
- Battery DC power supplies
- Field supply for DC motors

### Package: PWS-D

- Industry standard outline
- RoHS compliant
- Easy to mount with two screws
- Base plate: Copper internally DCB isolated
- 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	$V_R = 1200 V$		$T_{VJ} = 25^{\circ}C$		100	$\mu A$
		$V_R = 1200 V$		$T_{VJ} = 150^{\circ}C$		1.5	mA
$V_F$	forward voltage drop	$I_F = 30 A$		$T_{VJ} = 25^{\circ}C$		1.08	V
		$I_F = 60 A$				1.22	V
		$I_F = 30 A$		$T_{VJ} = 125^{\circ}C$		0.99	V
		$I_F = 60 A$				1.17	V
$I_{DAV}$	bridge output current	$T_C = 110^{\circ}C$		$T_{VJ} = 150^{\circ}C$		70	A
		rectangular	d = 0.5				
$V_{FO}$	threshold voltage			$T_{VJ} = 150^{\circ}C$		0.78	V
$r_F$	slope resistance					6	m $\Omega$
						} for power loss calculation only	
$R_{thJC}$	thermal resistance junction to case					0.9	K/W
$R_{thCH}$	thermal resistance case to heatsink				0.4		K/W
$P_{tot}$	total power dissipation			$T_C = 25^{\circ}C$		135	W
$I_{FSM}$	max. forward surge current	t = 10 ms; (50 Hz), sine		$T_{VJ} = 45^{\circ}C$		750	A
		t = 8,3 ms; (60 Hz), sine		$V_R = 0 V$		810	A
		t = 10 ms; (50 Hz), sine		$T_{VJ} = 150^{\circ}C$		640	A
		t = 8,3 ms; (60 Hz), sine		$V_R = 0 V$		690	A
$I^2t$	value for fusing	t = 10 ms; (50 Hz), sine		$T_{VJ} = 45^{\circ}C$		2.82	kA <sup>2</sup> s
		t = 8,3 ms; (60 Hz), sine		$V_R = 0 V$		2.73	kA <sup>2</sup> s
		t = 10 ms; (50 Hz), sine		$T_{VJ} = 150^{\circ}C$		2.05	kA <sup>2</sup> s
		t = 8,3 ms; (60 Hz), sine		$V_R = 0 V$		1.98	kA <sup>2</sup> s
$C_J$	junction capacitance	$V_R = 400 V; f = 1 MHz$		$T_{VJ} = 25^{\circ}C$		27	pF

Package PWS-D			Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit
$I_{RMS}$	RMS current	per terminal			150	A
$T_{stg}$	storage temperature		-40		125	°C
$T_{VJ}$	virtual junction temperature		-40		150	°C
<b>Weight</b>				153		g
$M_D$	mounting torque		4.25		5.75	Nm
$M_T$	terminal torque		4.25		5.75	Nm
$d_{Spp/App}$	creepage distance on surface   striking distance through air	terminal to terminal	9.5			mm
$d_{Spb/Appb}$		terminal to backside	26.0			mm
$V_{ISOL}$	isolation voltage	t = 1 second	3000			V
		t = 1 minute	2500			V



Ordering	Part Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	VBO72-12NO7	VBO72-12NO7	Box	10	471232

### Equivalent Circuits for Simulation

\* on die level

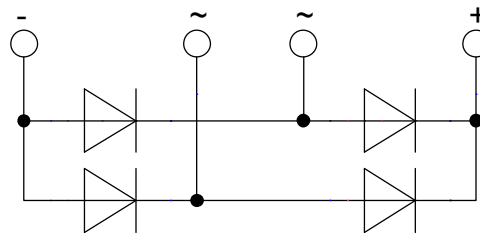
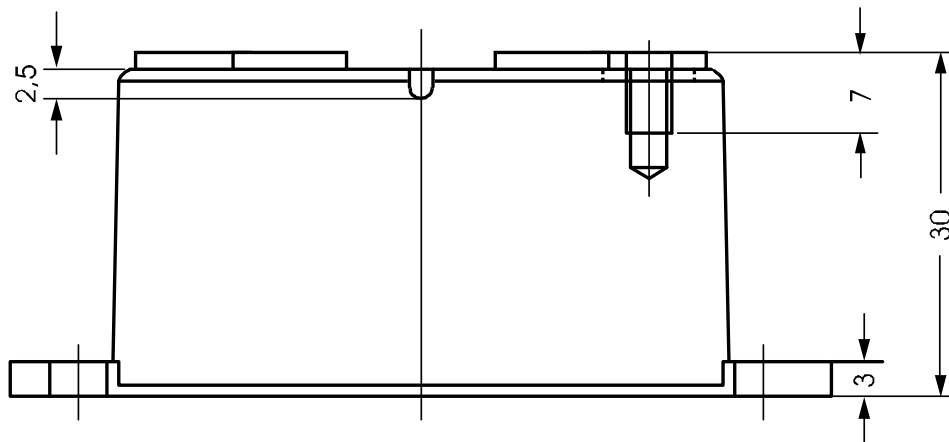
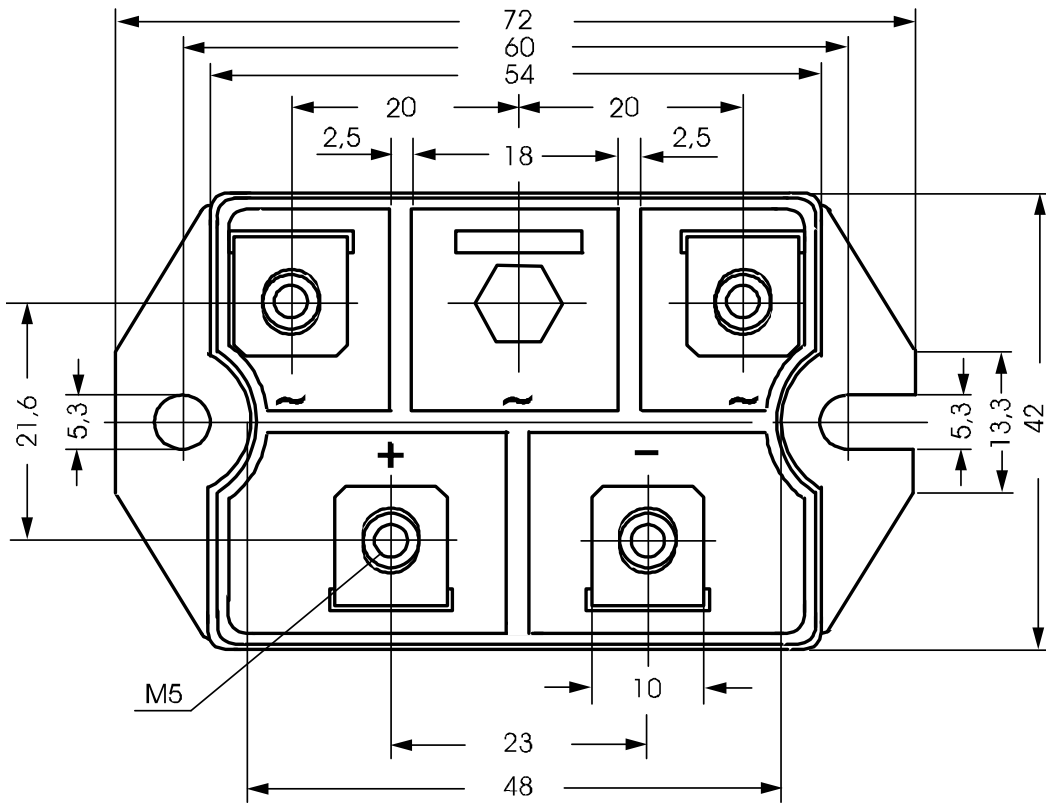
$T_{VJ} = 150\text{ °C}$



Rectifier

$V_{0\ max}$	threshold voltage	0.78	V
$R_{0\ max}$	slope resistance *	4.8	mΩ

**Outlines PWS-D**



## Rectifier

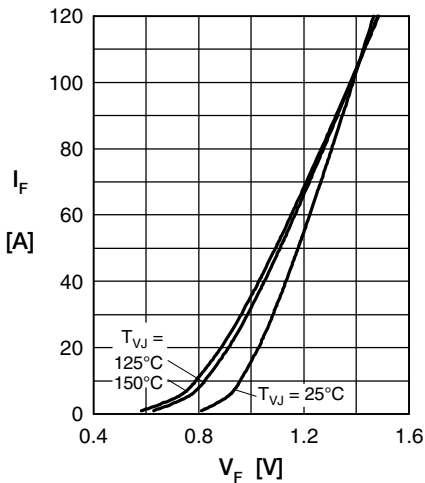


Fig. 1 Forward current versus voltage drop per diode

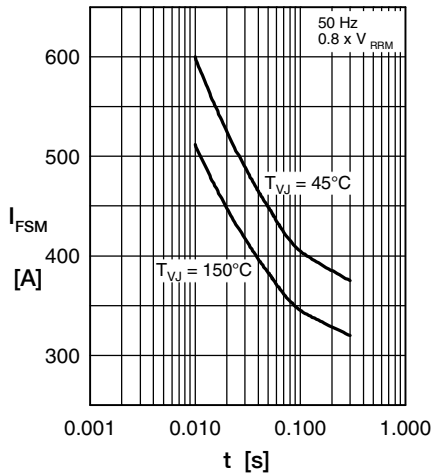


Fig. 2 Surge overload current

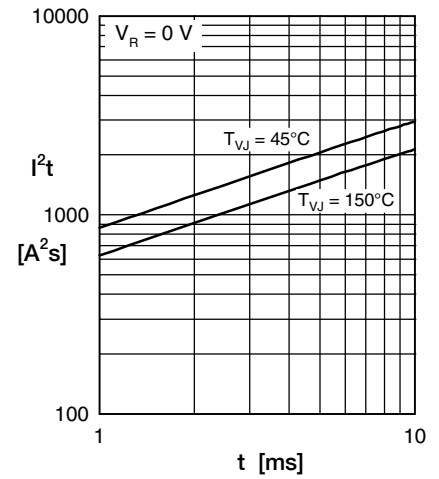


Fig. 3  $I^2t$  versus time per diode

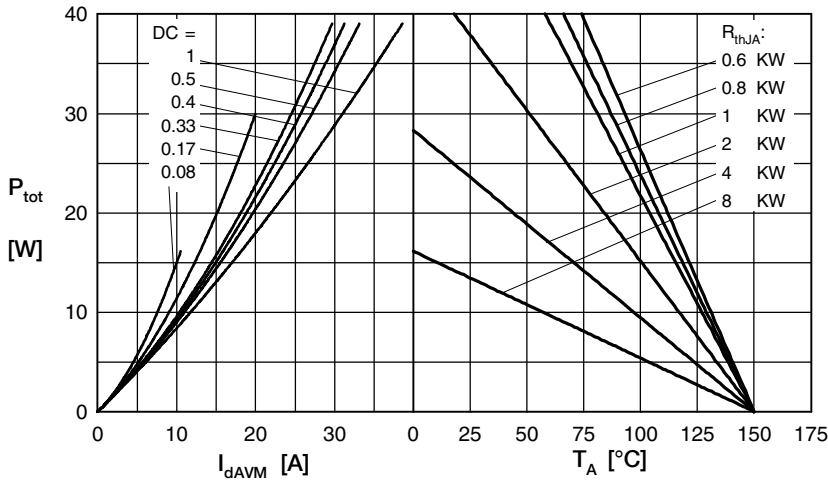


Fig. 4 Power dissipation vs. direct output current & ambient temperature

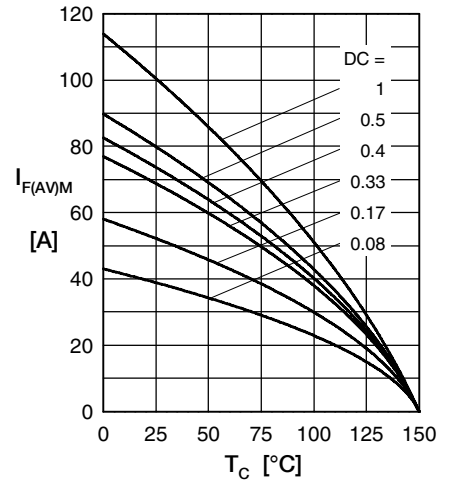


Fig. 5 Max. forward current vs. case temperature

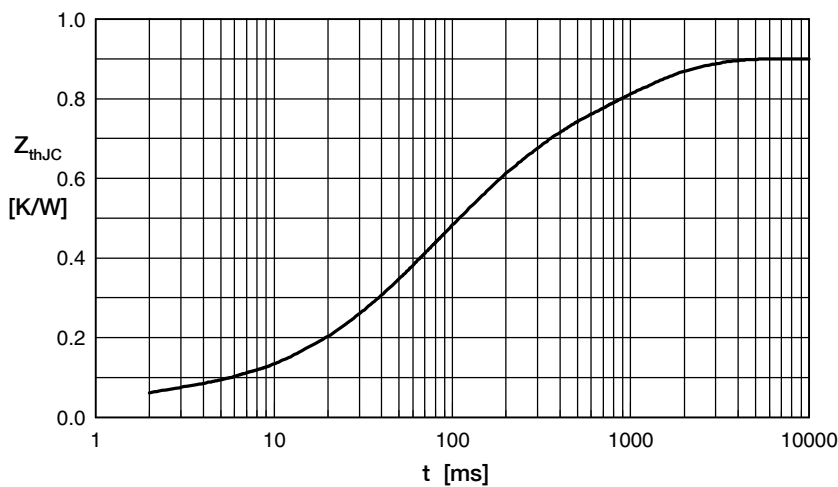


Fig. 6 Transient thermal impedance junction to case

Constants for  $Z_{thJC}$  calculation:

i	$R_{th}$ (K/W)	$t_i$ (s)
1	0.05	0.001
2	0.14	0.030
3	0.18	0.070
4	0.28	0.150
5	0.25	0.950