

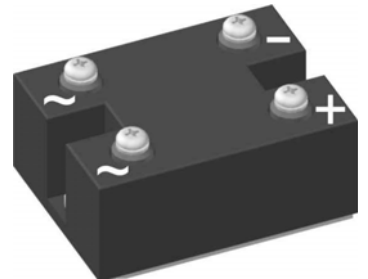
# Standard Rectifier Module


1~ Rectifier	
$V_{RRM}$	= 800 V
$I_{DAV}$	= 100 A
$I_{FSM}$	= 1500 A

## 1~ Rectifier Bridge

Part number

VBO105-08NO7



 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:

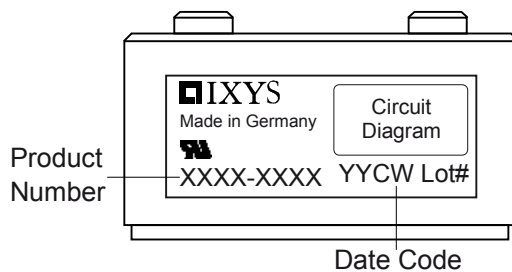
- Diode for main rectification
- For one phase bridge configurations
- Supplies for DC power equipment
- Input rectifiers for PWM inverter
- Battery DC power supplies
- Field supply for DC motors

### Package: PWS-C

- 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					900	V
$V_{RRM}$	max. repetitive reverse blocking voltage					800	V
$I_R$	reverse current	$V_R = 800\text{ V}$	$T_{VJ} = 25^\circ\text{C}$			100	$\mu\text{A}$
		$V_R = 800\text{ V}$	$T_{VJ} = 150^\circ\text{C}$			2	mA
$V_F$	forward voltage drop	$I_F = 40\text{ A}$	$T_{VJ} = 25^\circ\text{C}$			1.09	V
		$I_F = 80\text{ A}$				1.24	V
		$I_F = 40\text{ A}$	$T_{VJ} = 125^\circ\text{C}$			1.00	V
		$I_F = 80\text{ A}$				1.19	V
$I_{DAV}$	bridge output current	$T_C = 100^\circ\text{C}$	$T_{VJ} = 150^\circ\text{C}$			100	A
		rectangular	$d = 0.5$				
$V_{FO}$	threshold voltage	} for power loss calculation only				0.78	V
$r_F$	slope resistance					4.8	m $\Omega$
$R_{thJC}$	thermal resistance junction to case					0.8	K/W
$R_{thCH}$	thermal resistance case to heatsink				0.30		K/W
$P_{tot}$	total power dissipation			$T_C = 25^\circ\text{C}$		155	W
$I_{FSM}$	max. forward surge current	$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}$	$T_{VJ} = 45^\circ\text{C}$			1.50	kA
		$t = 8,3\text{ ms}; (60\text{ Hz}), \text{ sine}$	$V_R = 0\text{ V}$			1.62	kA
		$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}$	$T_{VJ} = 150^\circ\text{C}$			1.28	kA
		$t = 8,3\text{ ms}; (60\text{ Hz}), \text{ sine}$	$V_R = 0\text{ V}$			1.38	kA
$I^2t$	value for fusing	$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}$	$T_{VJ} = 45^\circ\text{C}$			11.3	kA <sup>2</sup> s
		$t = 8,3\text{ ms}; (60\text{ Hz}), \text{ sine}$	$V_R = 0\text{ V}$			10.9	kA <sup>2</sup> s
		$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}$	$T_{VJ} = 150^\circ\text{C}$			8.13	kA <sup>2</sup> s
		$t = 8,3\text{ ms}; (60\text{ Hz}), \text{ sine}$	$V_R = 0\text{ V}$			7.87	kA <sup>2</sup> s
$C_J$	junction capacitance	$V_R = 400\text{ V}; f = 1\text{ MHz}$		$T_{VJ} = 25^\circ\text{C}$		58	pF

Package PWS-C			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>				237		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	26.0			mm
$d_{Spb/Apb}$		terminal to backside	14.0			mm
$V_{ISOL}$	isolation voltage	t = 1 second	3000			V
		t = 1 minute	2500			V

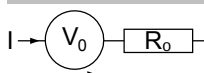


Ordering	Part Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	VBO105-08NO7	VBO105-08NO7	Box	10	475769

### Equivalent Circuits for Simulation

\* on die level

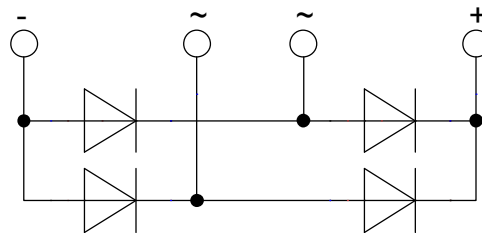
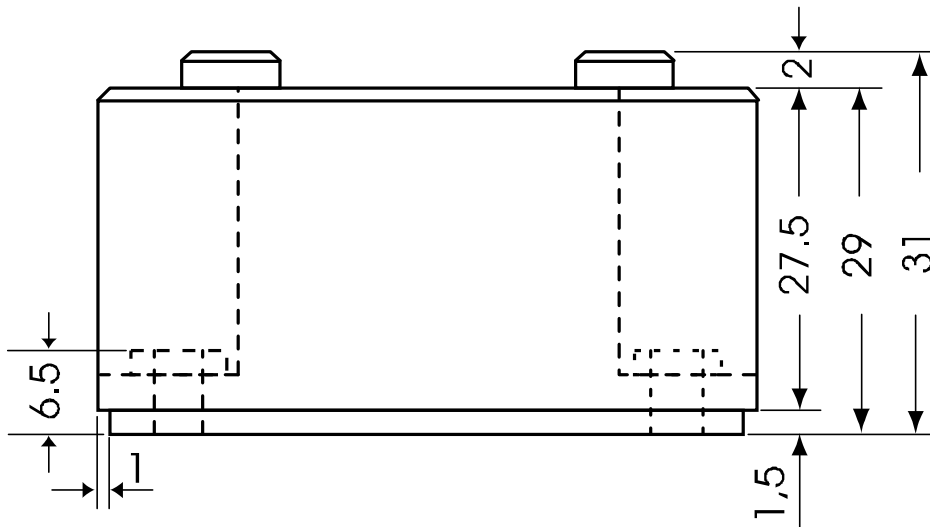
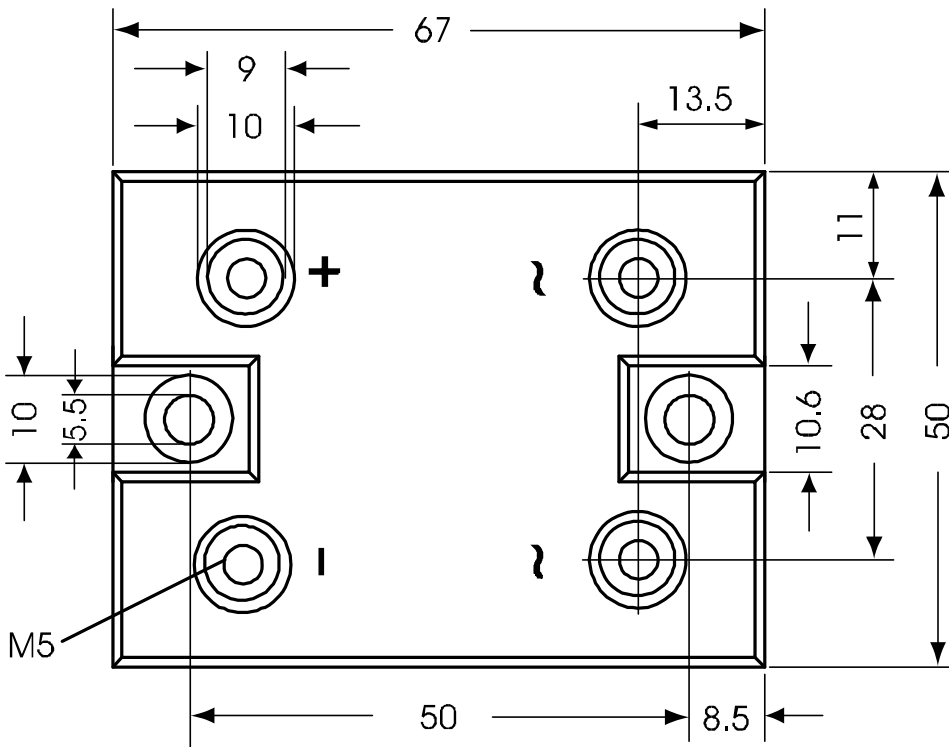
$T_{VJ} = 150\text{ °C}$



Rectifier

$V_{0\ max}$	threshold voltage	0.78	V
$R_{0\ max}$	slope resistance *	3.6	mΩ

**Outlines PWS-C**



Rectifier

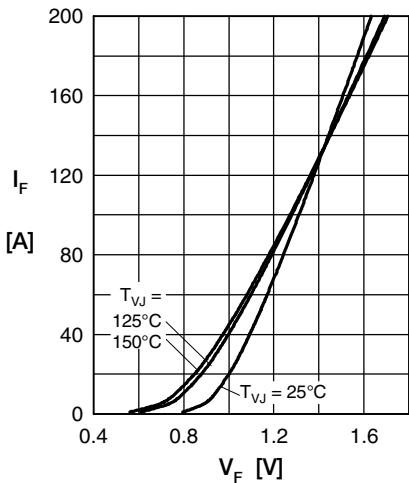


Fig. 1 Forward current versus voltage drop per diode

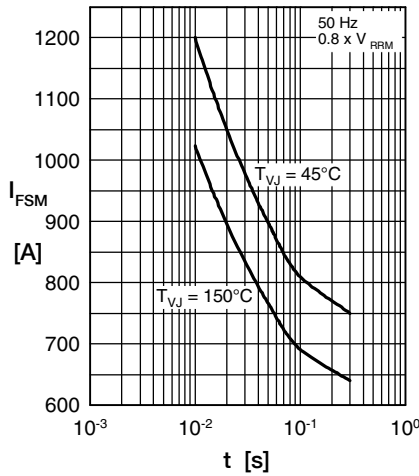


Fig. 2 Surge overload current vs. time per diode

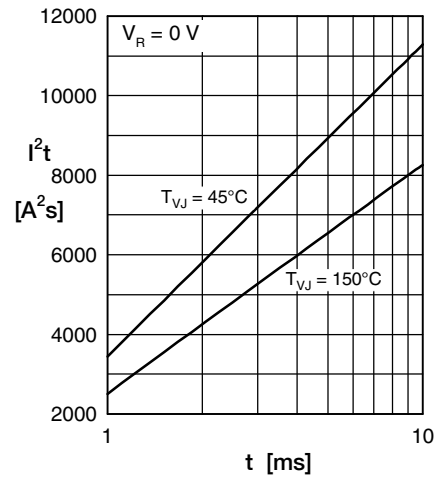


Fig. 3  $I^2t$  versus time per diode

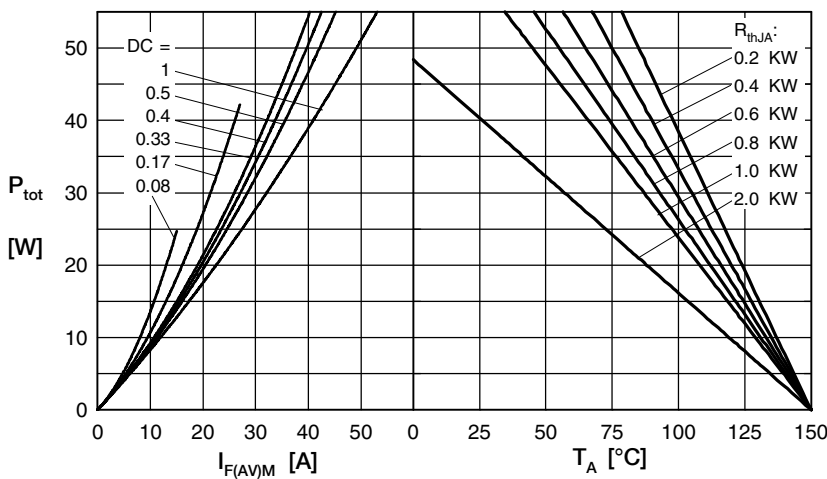


Fig. 4 Power dissipation vs. forward current and ambient temperature per diode

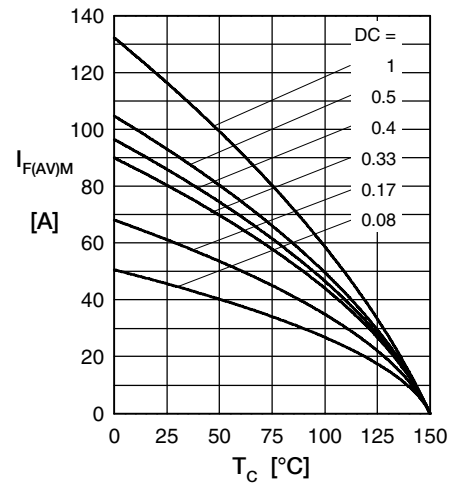


Fig. 5 Max. forward current vs. case temperature per diode

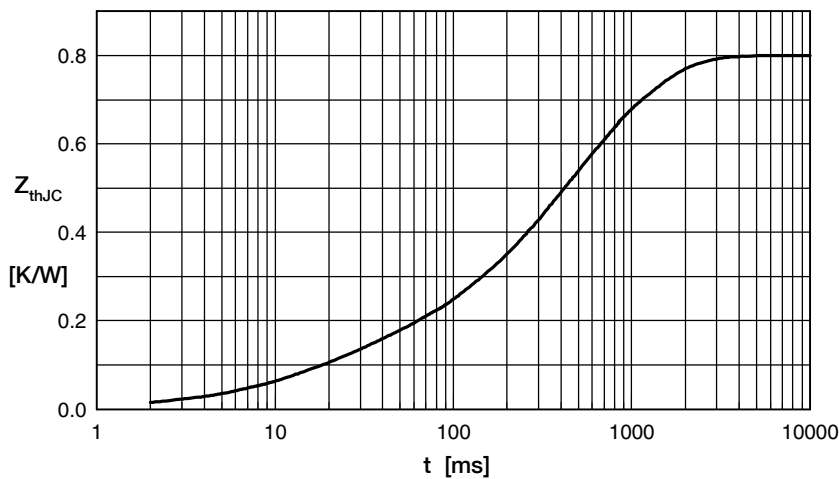


Fig. 6 Transient thermal impedance junction to case vs. time per diode

Constants for  $Z_{thJC}$  calculation:

i	$R_{th}$ (K/W)	$t_i$ (s)
1	0.100	0.020
2	0.014	0.010
3	0.192	0.225
4	0.281	0.800
5	0.213	0.580