

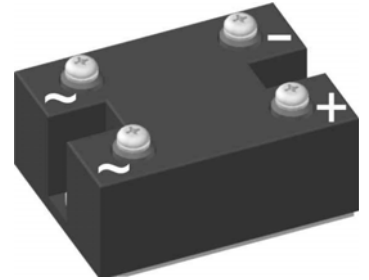
# Standard Rectifier Module

<b>1~ Rectifier</b>
$V_{RRM} = 1600\text{ V}$
$I_{DAV} = 125\text{ A}$
$I_{FSM} = 1800\text{ A}$

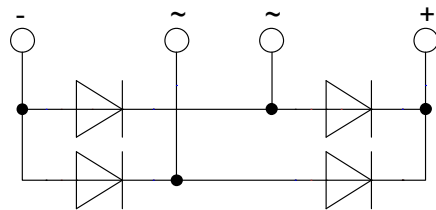
## 1~ Rectifier Bridge

Part number

VBO125-16NO7



 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:

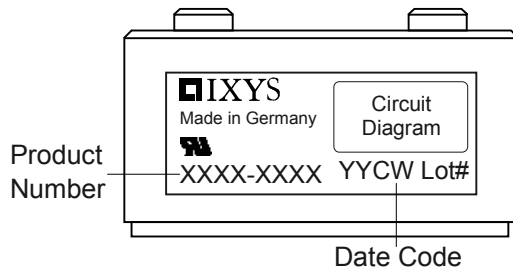
- Diode for main rectification
- For one phase bridge configurations
- Supplies for DC power equipment
- Input rectifiers for PWM inverter
- Battery DC power supplies
- Field supply for DC motors

### 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					1700	V	
$V_{RRM}$	max. repetitive reverse blocking voltage					1600	V	
$I_R$	reverse current	$V_R = 1600$ V	$T_{VJ} = 25^\circ\text{C}$			200	$\mu\text{A}$	
		$V_R = 1600$ V	$T_{VJ} = 150^\circ\text{C}$			2	mA	
$V_F$	forward voltage drop	$I_F = 50$ A	$T_{VJ} = 25^\circ\text{C}$			1.07	V	
						1.21	V	
		$I_F = 100$ A	$T_{VJ} = 125^\circ\text{C}$			0.97	V	
						1.15	V	
$I_{DAV}$	bridge output current	$T_C = 105^\circ\text{C}$ rectangular	$T_{VJ} = 150^\circ\text{C}$			125	A	
								d = 0.5
$V_{FO}$	threshold voltage					0.76	V	
$r_F$	slope resistance					3.6	m $\Omega$	
$R_{thJC}$	thermal resistance junction to case					0.6	K/W	
$R_{thCH}$	thermal resistance case to heatsink				0.3		K/W	
$P_{tot}$	total power dissipation			$T_C = 25^\circ\text{C}$		205	W	
$I_{FSM}$	max. forward surge current	t = 10 ms; (50 Hz), sine	$T_{VJ} = 45^\circ\text{C}$			1.80	kA	
								t = 8,3 ms; (60 Hz), sine
		t = 10 ms; (50 Hz), sine	$T_{VJ} = 150^\circ\text{C}$				1.53	kA
$I^2t$	value for fusing	t = 10 ms; (50 Hz), sine	$T_{VJ} = 45^\circ\text{C}$			16.2	kA <sup>2</sup> s	
								t = 8,3 ms; (60 Hz), sine
		t = 10 ms; (50 Hz), sine	$T_{VJ} = 150^\circ\text{C}$				11.7	kA <sup>2</sup> s
$C_J$	junction capacitance	$V_R = 400$ V; f = 1 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
$d_{Spb/Appb}$		terminal to backside	14.0			mm
$V_{ISOL}$	isolation voltage	t = 1 second	3000			V
		t = 1 minute	2500			V
		50/60 Hz, RMS; $I_{ISOL} \leq 1$ mA				



Ordering	Part Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	VBO125-16NO7	VBO125-16NO7	Box	10	470791

### Equivalent Circuits for Simulation

\* on die level

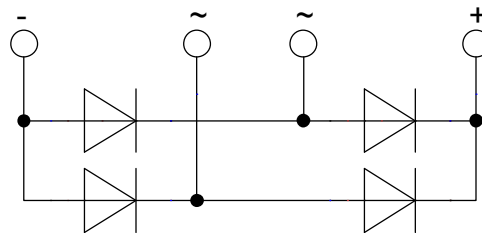
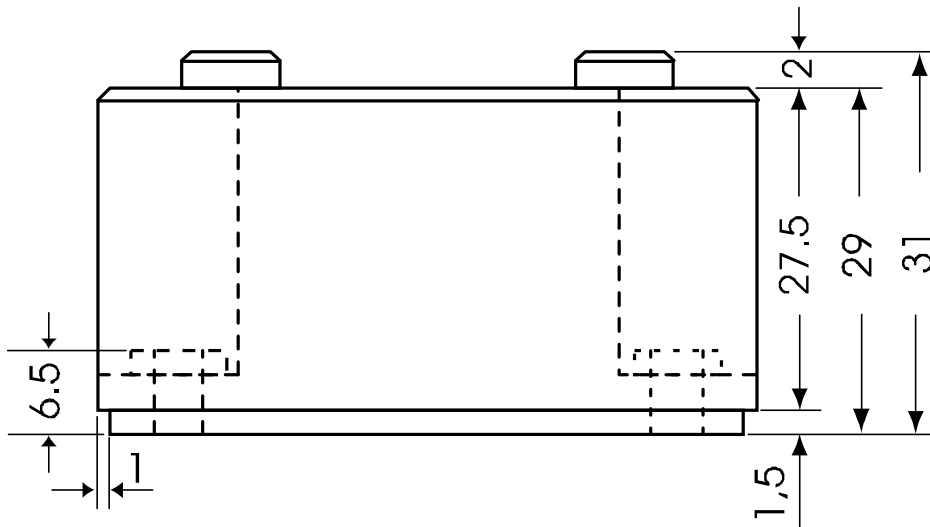
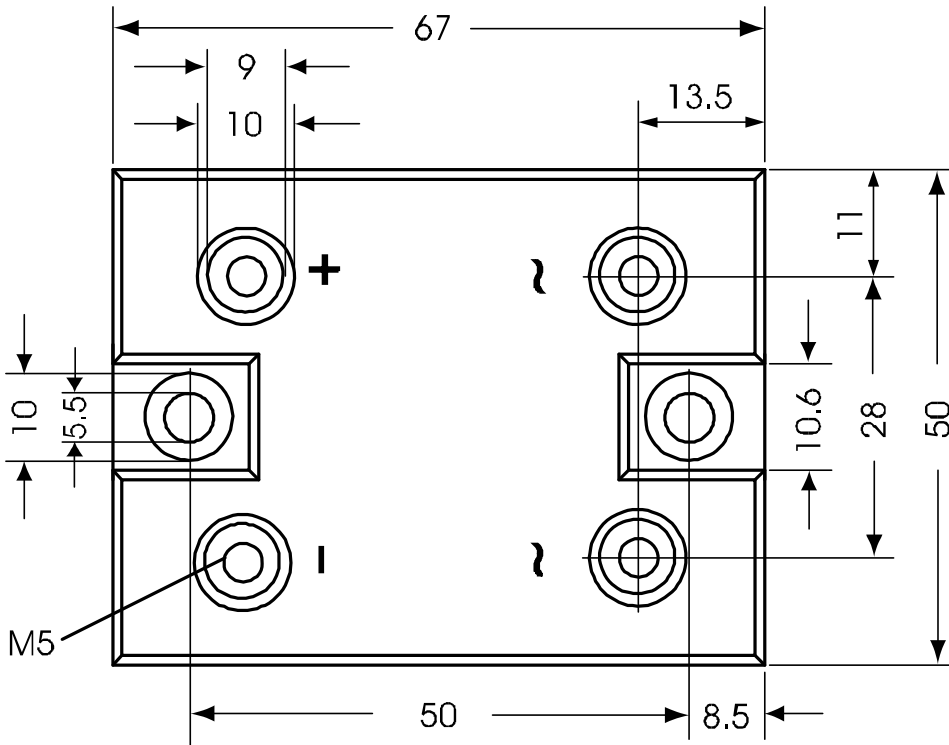
$T_{VJ} = 150^\circ\text{C}$



Rectifier

$V_{0\ max}$	threshold voltage	0.76	V
$R_{0\ max}$	slope resistance *	3.6	mΩ

**Outlines PWS-C**



## Rectifier

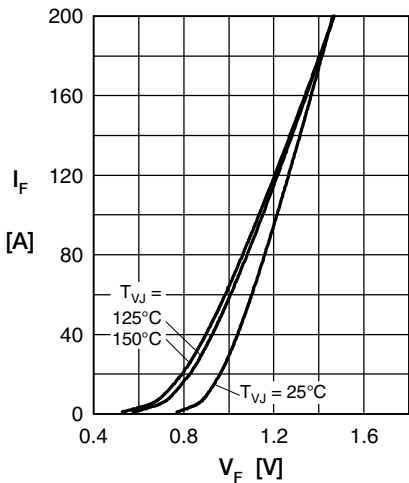


Fig. 1 Forward current versus voltage drop per diode

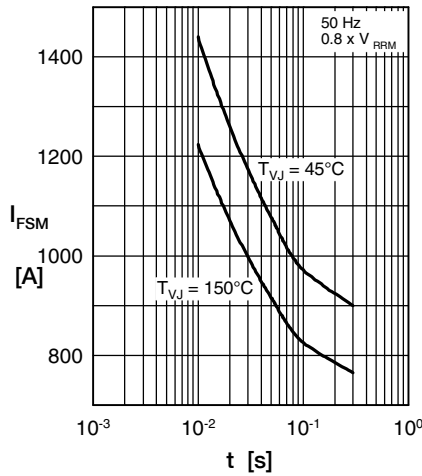


Fig. 2 Surge overload current vs. time per diode

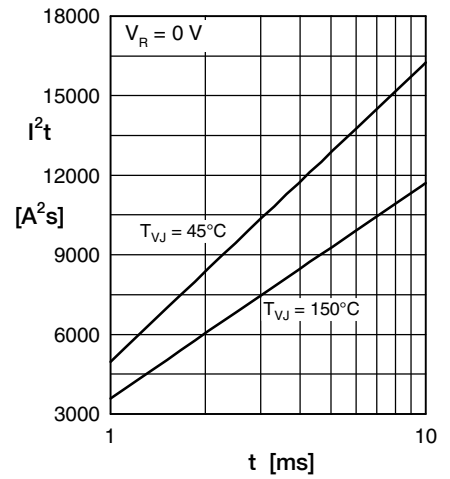


Fig. 3  $I^2t$  versus time per diode

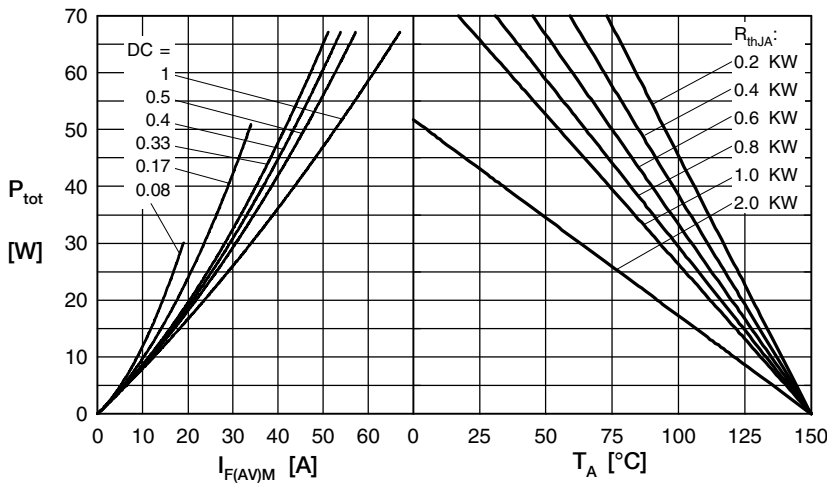


Fig. 4 Power dissipation vs. forward current and ambient temperature per diode

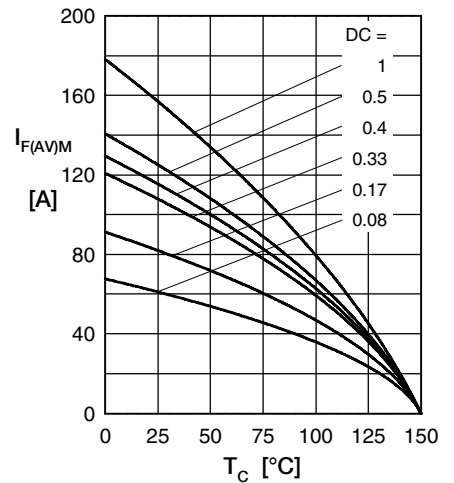


Fig. 5 Max. forward current vs. case temperature per diode

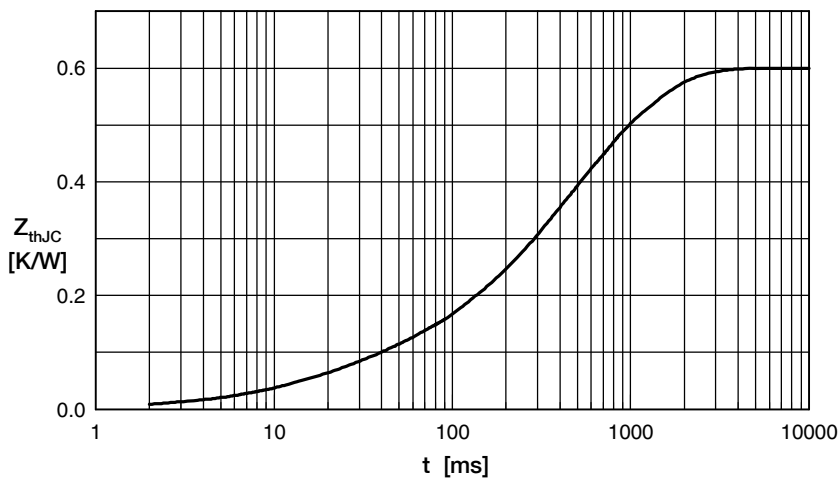


Fig. 6 Transient thermal impedance junction to case vs. time per diode

Constants for  $Z_{thJC}$  calculation:

i	$R_{th}$ (K/W)	$t_i$ (s)
1	0.060	0.020
2	0.003	0.010
3	0.150	0.225
4	0.243	0.800
5	0.144	0.580