

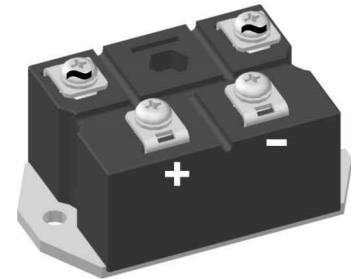
Standard Rectifier Module

1~ Rectifier	
V_{RRM}	= 1600 V
I_{DAV}	= 70 A
I_{FSM}	= 750 A

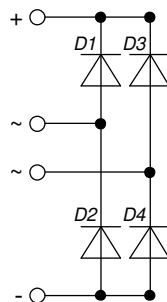
1~ Rectifier Bridge

Part number

VBO72-16NO7



 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-D

- Isolation Voltage: 3000 V~
- Industry standard outline
- RoHS compliant
- Easy to mount with two screws
- Base plate: Copper internally DCB isolated
- Advanced power cycling

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Rectifier				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
V_{RSM}	max. non-repetitive reverse blocking voltage	$T_{VJ} = 25^{\circ}\text{C}$				1700	V
V_{RRM}	max. repetitive reverse blocking voltage	$T_{VJ} = 25^{\circ}\text{C}$				1600	V
I_R	reverse current	$V_R = 1600\text{ V}$	$T_{VJ} = 25^{\circ}\text{C}$			100	μA
		$V_R = 1600\text{ V}$	$T_{VJ} = 150^{\circ}\text{C}$			1.5	mA
V_F	forward voltage drop	$I_F = 30\text{ A}$	$T_{VJ} = 25^{\circ}\text{C}$			1.08	V
		$I_F = 60\text{ A}$				1.22	V
		$I_F = 30\text{ A}$	$T_{VJ} = 125^{\circ}\text{C}$			0.99	V
		$I_F = 60\text{ A}$				1.17	V
I_{DAV}	bridge output current	$T_C = 110^{\circ}\text{C}$ rectangular	$T_{VJ} = 150^{\circ}\text{C}$ d = 0.5			70	A
V_{F0}	threshold voltage	} for power loss calculation only		$T_{VJ} = 150^{\circ}\text{C}$		0.78	V
r_F	slope resistance					6	m Ω
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	$T_C = 25^{\circ}\text{C}$				135	W
I_{FSM}	max. forward surge current	t = 10 ms; (50 Hz), sine	$T_{VJ} = 45^{\circ}\text{C}$			750	A
		t = 8,3 ms; (60 Hz), sine	$V_R = 0\text{ V}$			810	A
		t = 10 ms; (50 Hz), sine	$T_{VJ} = 150^{\circ}\text{C}$			640	A
		t = 8,3 ms; (60 Hz), sine	$V_R = 0\text{ V}$			690	A
I^2t	value for fusing	t = 10 ms; (50 Hz), sine	$T_{VJ} = 45^{\circ}\text{C}$			2.82	kA ² s
		t = 8,3 ms; (60 Hz), sine	$V_R = 0\text{ V}$			2.73	kA ² s
		t = 10 ms; (50 Hz), sine	$T_{VJ} = 150^{\circ}\text{C}$			2.05	kA ² s
		t = 8,3 ms; (60 Hz), sine	$V_R = 0\text{ V}$			1.98	kA ² s
C_J	junction capacitance	$V_R = 400\text{ V}; f = 1\text{ MHz}$		$T_{VJ} = 25^{\circ}\text{C}$	27		pF

Package PWS-D				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
I_{RMS}	RMS current	per terminal				150	A
T_{VJ}	virtual junction temperature			-40		150	°C
T_{op}	operation temperature			-40		125	°C
T_{stg}	storage temperature			-40		125	°C
Weight					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
$d_{Spb/Apb}$		terminal to backside		26.0			mm
V_{ISOL}	isolation voltage	t = 1 second	50/60 Hz, RMS; $I_{ISOL} \leq 1$ mA	3000			V
		t = 1 minute		2500			V



Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	VBO72-16NO7	VBO72-16NO7	Box	10	471240

Equivalent Circuits for Simulation

* on die level

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

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

Technical drawing of a mechanical part, showing top and side views with dimensions.

Top View Dimensions:

- Overall width: 72
- Overall height: 42
- Top section width (left to right): 60, 54
- Top section height (left to right): 20, 20
- Top section width (left to right): 2,5, 18, 2,5
- Bottom section width (left to right): 23, 10
- Bottom section height (left to right): 2,5, 5,3, 13,3
- Bottom section width (left to right): 48
- Bottom section height (left to right): 21,6, 5,3
- Bottom section width (left to right): 2,5, 10, 2,5
- Bottom section height (left to right): 2,5, 5,3, 13,3
- Bottom section width (left to right): 48
- Bottom section height (left to right): 21,6, 5,3
- Bottom section width (left to right): 2,5, 10, 2,5
- Bottom section height (left to right): 2,5, 5,3, 13,3

Side View Dimensions:

- Overall width: 30
- Overall height: 7
- Top section width (left to right): 2,5, 5,3, 13,3
- Top section height (left to right): 2,5, 5,3, 13,3
- Bottom section width (left to right): 2,5, 5,3, 13,3
- Bottom section height (left to right): 2,5, 5,3, 13,3

Other Features:

- Top view shows a central hexagonal feature and two circular features on the left and right sides.
- Side view shows a central rectangular feature and two circular features on the left and right sides.
- Dimensions are given in millimeters (mm).



Rectifier


Fig. 1 Forward current versus voltage drop per diode

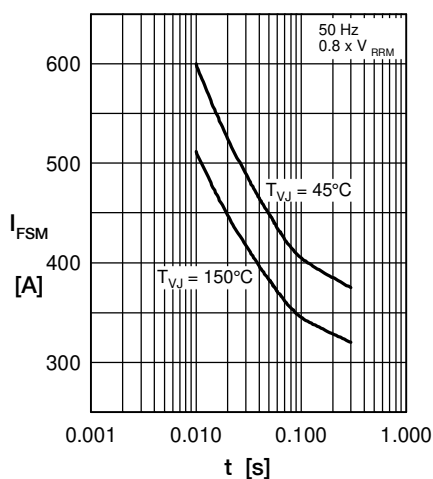


Fig. 2 Surge overload current

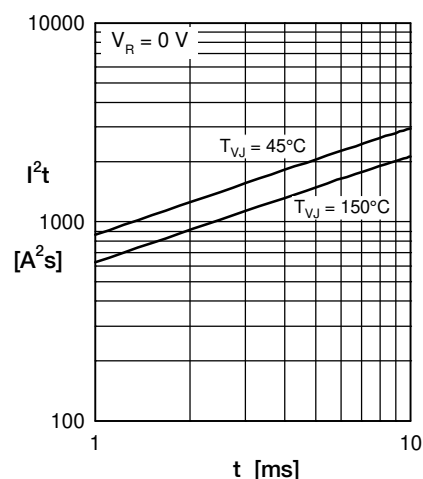

 Fig. 3 I^2t versus time per diode


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



Fig. 5 Max. forward current vs. case temperature

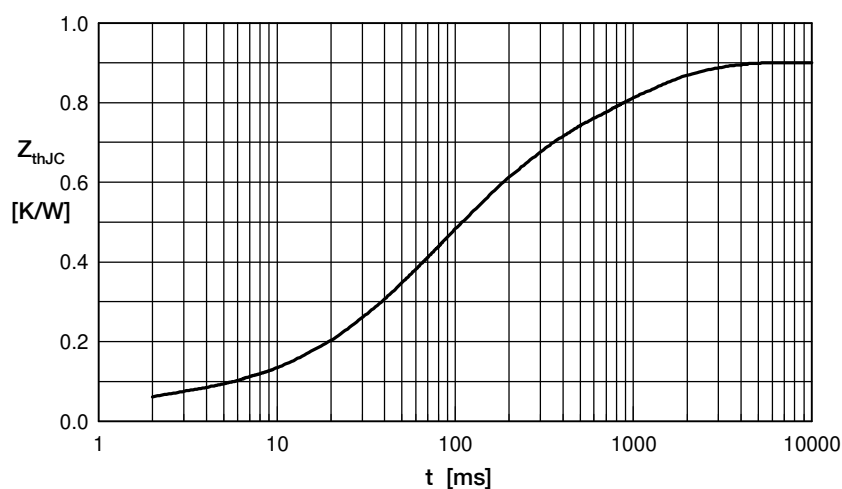


Fig. 6 Transient thermal impedance junction to case

 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