

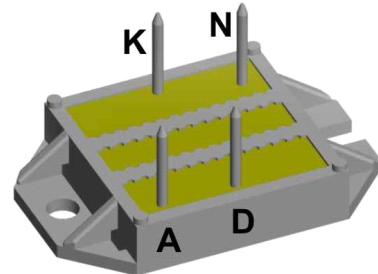
Standard Rectifier Module

1~ Rectifier	
V_{RRM}	= 1200
I_{DAV}	= 55
I_{FSM}	= 300

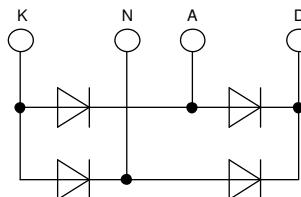
1~ Rectifier Bridge

Part number

VBO54-12NO7



 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: ECO-PAC1

- Isolation Voltage: 3000 V~
- Industry standard outline
- RoHS compliant
- Soldering pins for PCB mounting
- Height: 9 mm
- Base plate: DCB ceramic
- Reduced weight
- Advanced power cycling

Terms .Conditions of usage:

The data contained in this product data sheet is exclusively intended for technically trained staff. The user will have to evaluate the suitability of the product for the intended application and the completeness of the product data with respect to his application. The specifications of our components may not be considered as an assurance of component characteristics. The information in the valid application- and assembly notes must be considered. Should you require product information in excess of the data given in this product data sheet or which concerns the specific application of your product, please contact your local sales office.

Due to technical requirements our product may contain dangerous substances. For information on the types in question please contact your local sales office.

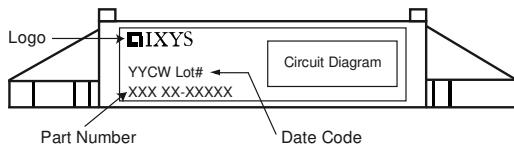
Should you intend to use the product in aviation, in health or life endangering or life support applications, please notify. For any such application we urgently recommend

- to perform joint risk and quality assessments;
- the conclusion of quality agreements;
- to establish joint measures of an ongoing product survey, and that we may make delivery dependent on the realization of any such measures.

Rectifier

Symbol	Definition	Conditions	Ratings			
			min.	typ.	max.	
V_{RSM}	max. non-repetitive reverse blocking voltage	$T_{VJ} = 25^\circ\text{C}$			1300	V
V_{RRM}	max. repetitive reverse blocking voltage	$T_{VJ} = 25^\circ\text{C}$			1200	V
I_R	reverse current	$V_R = 1200 \text{ V}$ $V_R = 1200 \text{ V}$	$T_{VJ} = 25^\circ\text{C}$ $T_{VJ} = 150^\circ\text{C}$		40 1.5	μA mA
V_F	forward voltage drop	$I_F = 20 \text{ A}$	$T_{VJ} = 25^\circ\text{C}$		1.15	V
		$I_F = 40 \text{ A}$			1.34	V
		$I_F = 20 \text{ A}$	$T_{VJ} = 125^\circ\text{C}$		1.12	V
		$I_F = 40 \text{ A}$			1.32	V
I_{DAV}	bridge output current	$T_C = 105^\circ\text{C}$ rectangular	$T_{VJ} = 150^\circ\text{C}$ $d = 0.5$		55	A
V_{F0} r_F	threshold voltage slope resistance } for power loss calculation only		$T_{VJ} = 150^\circ\text{C}$		0.82 12.2	V $\text{m}\Omega$
R_{thJC}	thermal resistance junction to case				1.1	K/W
R_{thCH}	thermal resistance case to heatsink				0.4	K/W
P_{tot}	total power dissipation		$T_C = 25^\circ\text{C}$		110	W
I_{FSM}	max. forward surge current	$t = 10 \text{ ms}; (50 \text{ Hz}), \text{sine}$	$T_{VJ} = 45^\circ\text{C}$		300	A
		$t = 8,3 \text{ ms}; (60 \text{ Hz}), \text{sine}$	$V_R = 0 \text{ V}$		325	A
		$t = 10 \text{ ms}; (50 \text{ Hz}), \text{sine}$	$T_{VJ} = 150^\circ\text{C}$		255	A
		$t = 8,3 \text{ ms}; (60 \text{ Hz}), \text{sine}$	$V_R = 0 \text{ V}$		275	A
I^2t	value for fusing	$t = 10 \text{ ms}; (50 \text{ Hz}), \text{sine}$	$T_{VJ} = 45^\circ\text{C}$		450	A^2s
		$t = 8,3 \text{ ms}; (60 \text{ Hz}), \text{sine}$	$V_R = 0 \text{ V}$		440	A^2s
		$t = 10 \text{ ms}; (50 \text{ Hz}), \text{sine}$	$T_{VJ} = 150^\circ\text{C}$		325	A^2s
		$t = 8,3 \text{ ms}; (60 \text{ Hz}), \text{sine}$	$V_R = 0 \text{ V}$		315	A^2s
C_J	junction capacitance	$V_R = 400 \text{ V}; f = 1 \text{ MHz}$	$T_{VJ} = 25^\circ\text{C}$	10		pF

Package ECO-PAC1			Ratings		
Symbol	Definition	Conditions	min.	typ.	max.
I_{RMS}	<i>RMS current</i>	per terminal			100 A
T_{VJ}	<i>virtual junction temperature</i>		-40		150 °C
T_{op}	<i>operation temperature</i>		-40		125 °C
T_{stg}	<i>storage temperature</i>		-40		125 °C
Weight				19	g
M_D	<i>mounting torque</i>		1.4		2 Nm
$d_{Spp/App}$	<i>creepage distance on surface / striking distance through air</i>		<i>terminal to terminal</i>		6.0 mm
$d_{Spb/Apb}$	<i>creepage distance on surface / striking distance through air</i>		<i>terminal to backside</i>		10.0 mm
V_{ISOL}	<i>isolation voltage</i>	$t = 1$ second $t = 1$ minute	50/60 Hz, RMS; $I_{ISOL} \leq 1$ mA		3000 V 2500 V

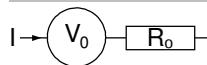


Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	VBO54-12NO7	VBO54-12NO7	Box	25	479543

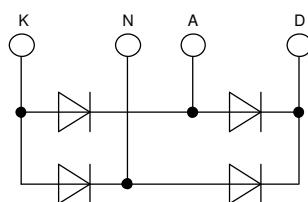
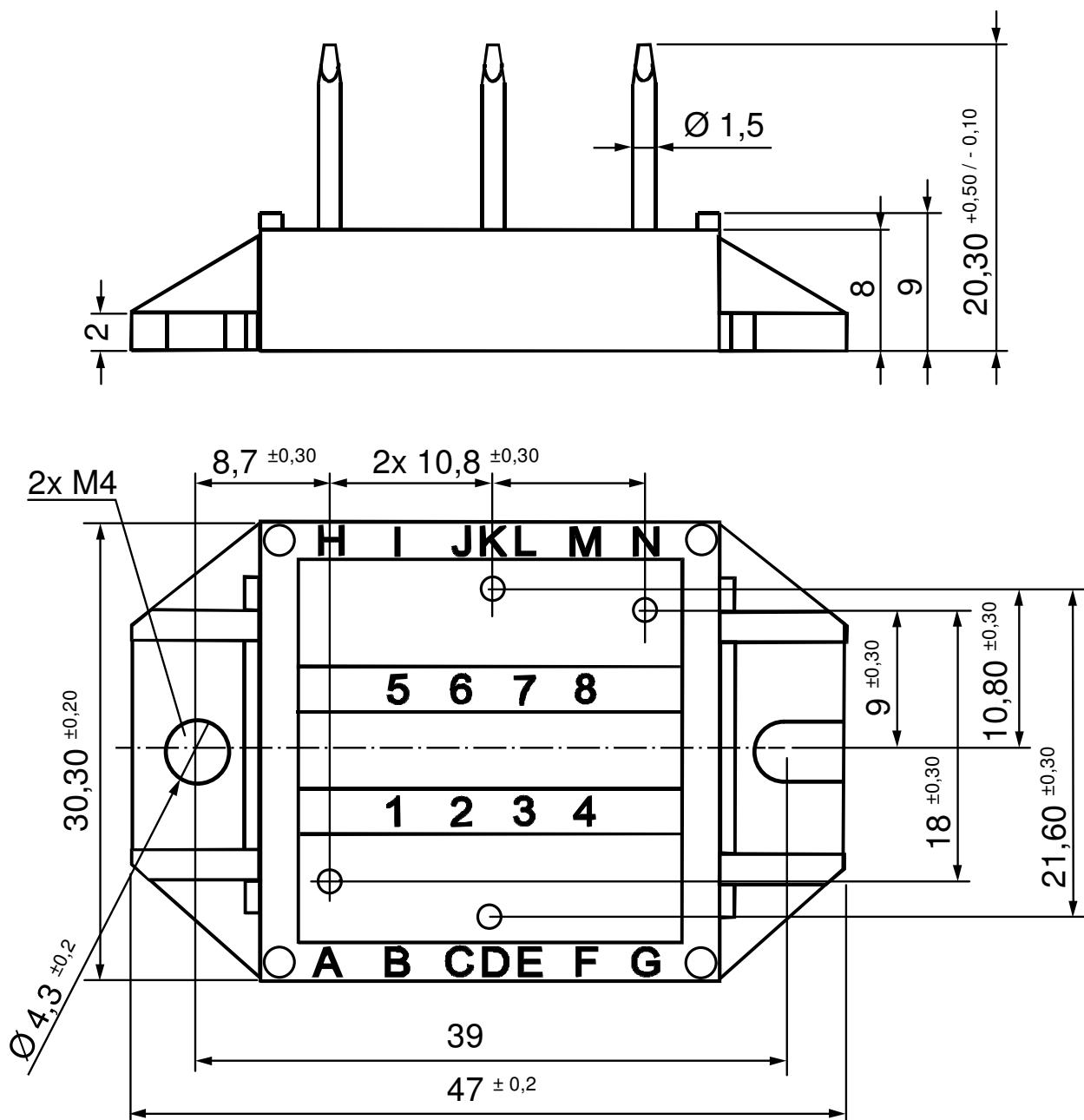
Equivalent Circuits for Simulation

* on die level

 $T_{VJ} = 150$ °C

	Rectifier
$V_{0\max}$	threshold voltage 0.82 V
$R_{0\max}$	slope resistance * 11 mΩ

Outlines ECO-PAC1



Rectifier

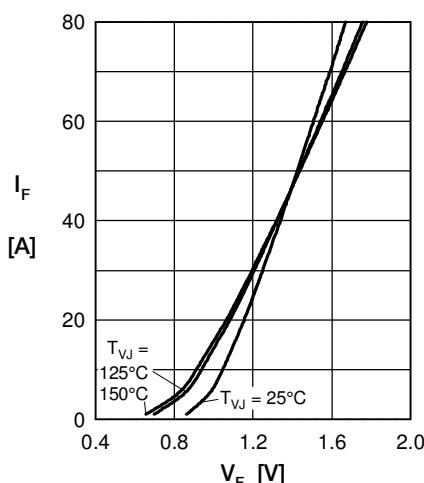


Fig. 1 Forward current versus voltage drop per diode

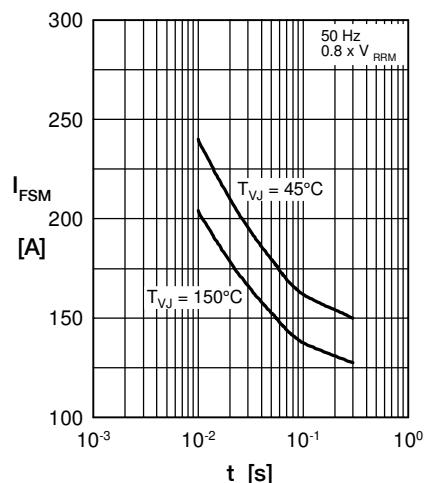


Fig. 2 Surge overload current

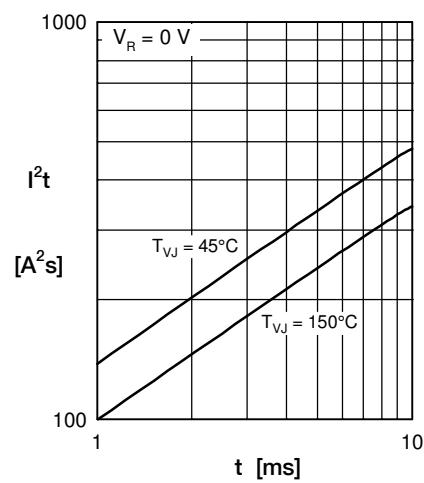
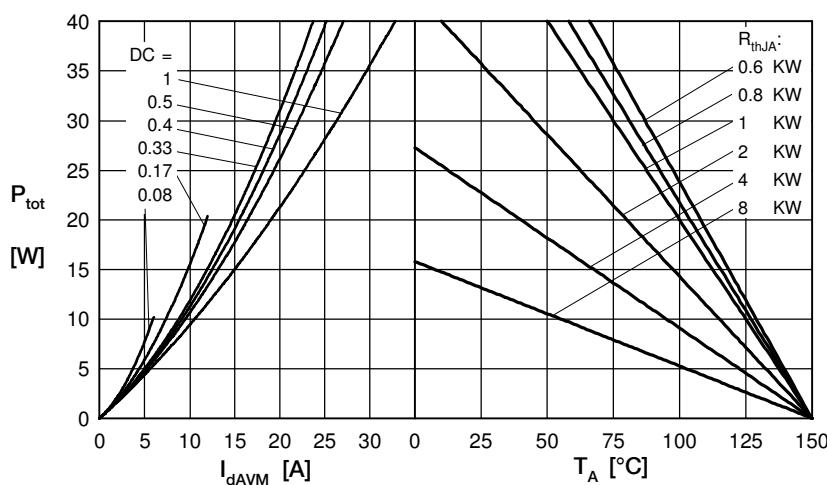
Fig. 3 I^2t versus time per diode

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

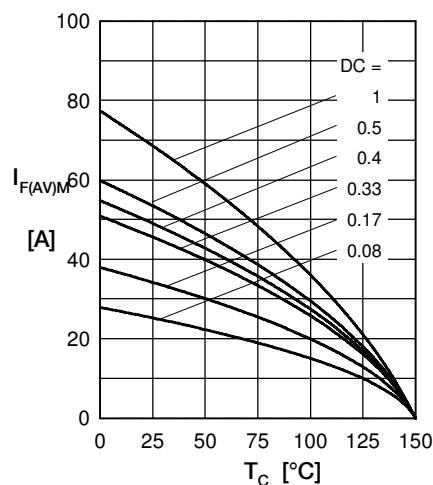


Fig. 5 Max. forward current vs. case temperature

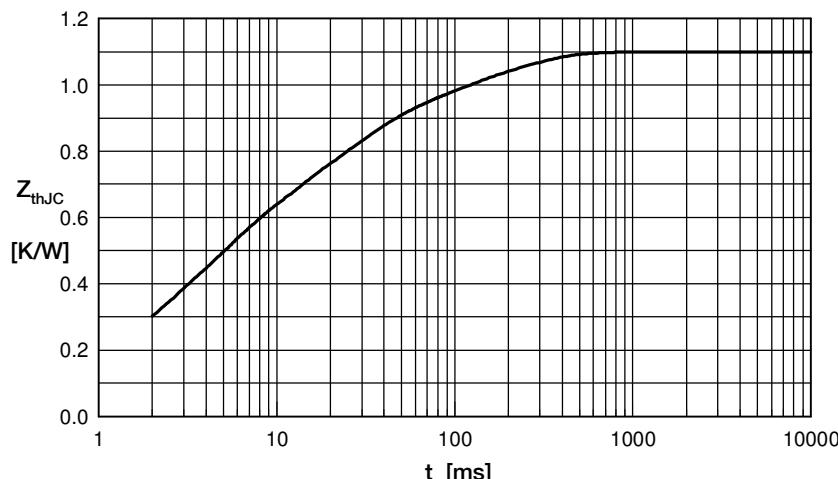


Fig. 6 Transient thermal impedance junction to case

Constants for Z_{thJC} calculation:

i	R_{th} (K/W)	t_i (s)
1	0.05070	0.004
2	0.163	0.0025
3	0.2805	0.0035
4	0.363	0.02
5	0.2228	0.15

Mouser Electronics

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