

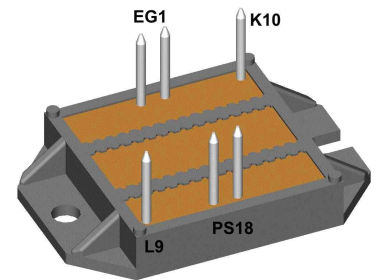
Standard Rectifier Module

1~ Rectifier	
$V_{RRM} =$	800 V
$I_{DAV} =$	80 A
$I_{FSM} =$	750 A

1~ Rectifier Bridge

Part number

VBO78-08NO7



 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: ECO-PAC2

- 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

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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	μA
		$V_R = 800\text{ V}$		$T_{VJ} = 150^\circ\text{C}$		1.5	mA
V_F	forward voltage drop	$I_F = 40\text{ A}$		$T_{VJ} = 25^\circ\text{C}$		1.14	V
		$I_F = 80\text{ A}$				1.32	V
		$I_F = 40\text{ A}$		$T_{VJ} = 125^\circ\text{C}$		1.06	V
		$I_F = 80\text{ A}$				1.29	V
I_{DAV}	bridge output current	$T_C = 115^\circ\text{C}$		$T_{VJ} = 150^\circ\text{C}$		80	A
		rectangular	$d = 0.5$				
V_{F0}	threshold voltage			$T_{VJ} = 150^\circ\text{C}$		0.81	V
r_F	slope resistance					5.9	m Ω
						} for power loss calculation only	
R_{thJC}	thermal resistance junction to case					0.7	K/W
R_{thCH}	thermal resistance case to heatsink				0.3		K/W
P_{tot}	total power dissipation			$T_C = 25^\circ\text{C}$		175	W
I_{FSM}	max. forward surge current	$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}$		$T_{VJ} = 45^\circ\text{C}$		750	A
		$t = 8,3\text{ ms}; (60\text{ Hz}), \text{ sine}$		$V_R = 0\text{ V}$		810	A
		$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}$		$T_{VJ} = 150^\circ\text{C}$		640	A
		$t = 8,3\text{ ms}; (60\text{ Hz}), \text{ sine}$		$V_R = 0\text{ V}$		690	A
I^2t	value for fusing	$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}$		$T_{VJ} = 45^\circ\text{C}$		2.82	kA ² s
		$t = 8,3\text{ ms}; (60\text{ Hz}), \text{ sine}$		$V_R = 0\text{ V}$		2.73	kA ² s
		$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}$		$T_{VJ} = 150^\circ\text{C}$		2.05	kA ² s
		$t = 8,3\text{ ms}; (60\text{ Hz}), \text{ sine}$		$V_R = 0\text{ V}$		1.98	kA ² s
C_J	junction capacitance	$V_R = 400\text{ V}; f = 1\text{ MHz}$		$T_{VJ} = 25^\circ\text{C}$		11	pF



Package ECO-PAC2		Ratings				
Symbol	Definition	Conditions	min.	typ.	max.	Unit
I_{RMS}	RMS current	per terminal			100	A
T_{VJ}	virtual junction temperature		-40		150	°C
T_{op}	operation temperature		-40		125	°C
T_{stg}	storage temperature		-40		125	°C
Weight				24		g
M_D	mounting torque		1.4		2	Nm
$d_{Spp/App}$	creepage distance on surface / striking distance through air	terminal to terminal	6.0			mm
$d_{Spb/Apb}$		terminal to backside	10.0			mm
V_{ISOL}	isolation voltage	t = 1 second	3000			V
		t = 1 minute	2500			V



Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	VBO78-08NO7	VBO78-08NO7	Box	25	494313

Equivalent Circuits for Simulation

* on die level

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

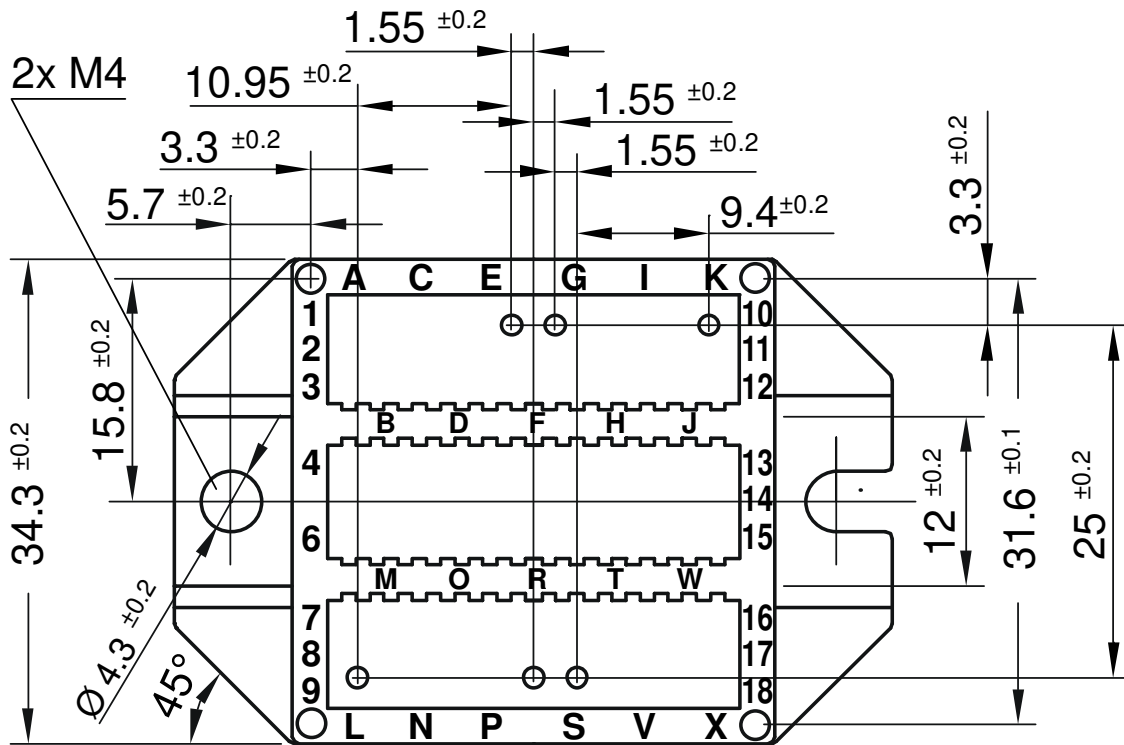


Rectifier

$V_{0\ max}$	threshold voltage	0.81	V
$R_{0\ max}$	slope resistance *	4.6	mΩ



Outlines ECO-PAC2





Rectifier

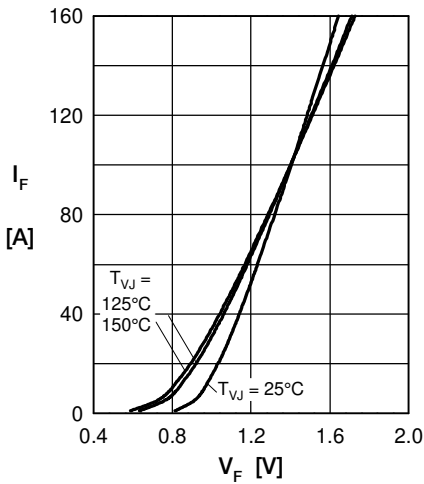


Fig. 1 Forward current versus voltage drop per diode

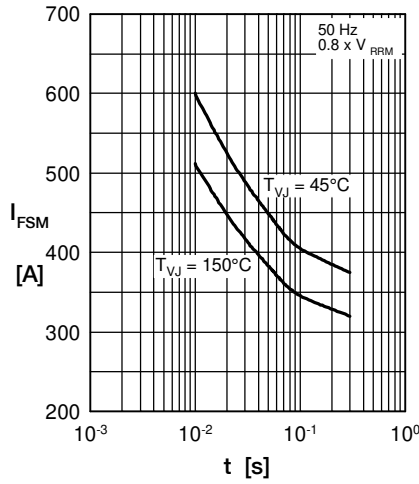


Fig. 2 Surge overload current

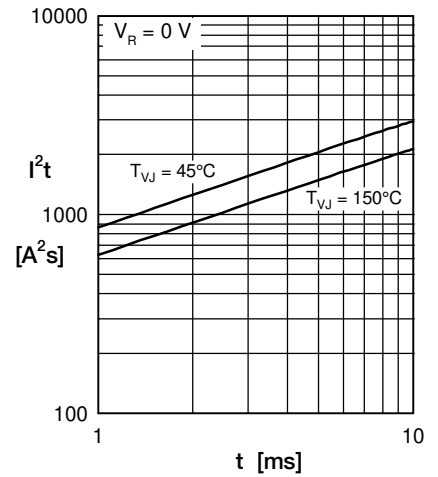


Fig. 3 I^2t versus time per diode

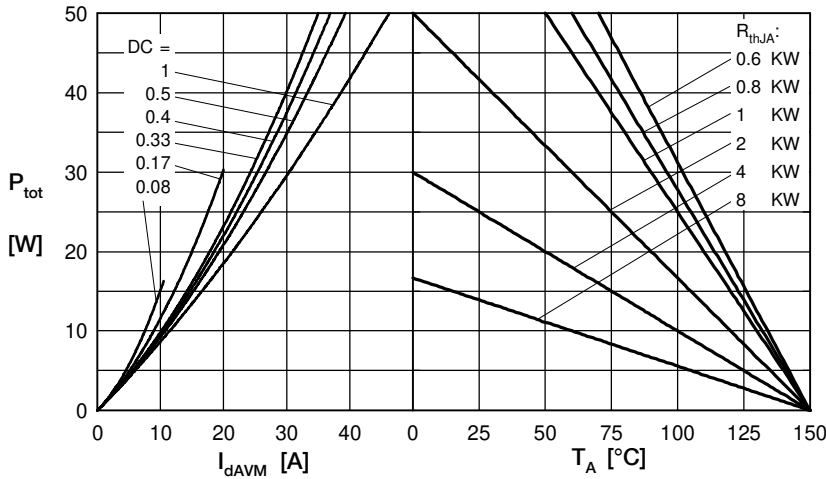


Fig. 4 Power dissipation vs. direct output current & ambient temperature

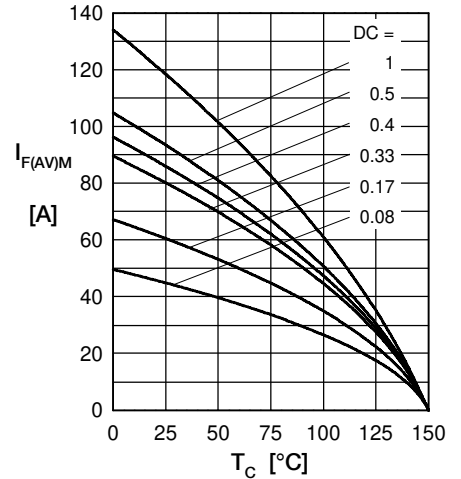


Fig. 5 Max. forward current vs. case temperature

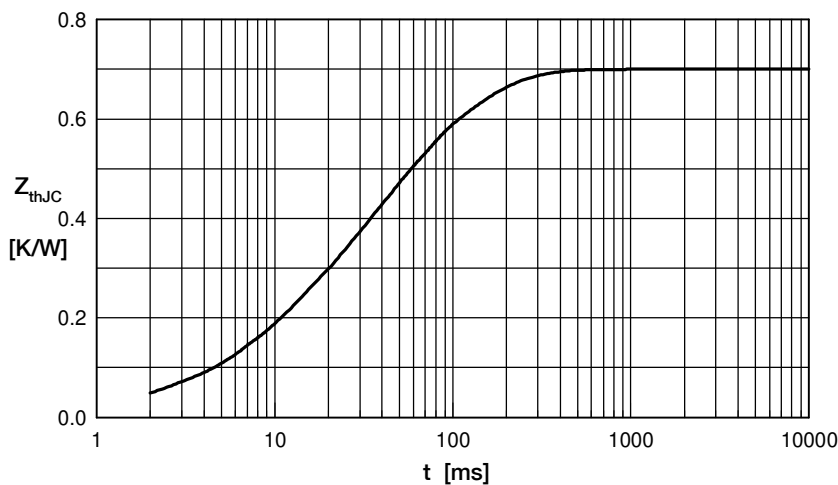


Fig. 6 Transient thermal impedance junction to case

Constants for Z_{thJC} calculation:

i	R_{th} (K/W)	t_i (s)
1	0.09	0.012
2	0.05	0.007
3	0.32	0.036
4	0.24	0.102

