



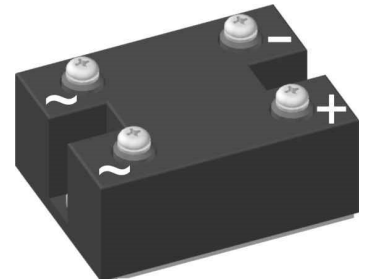
Standard Rectifier Module

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

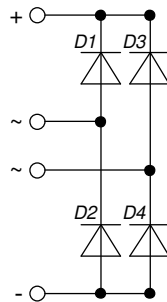
1~ Rectifier Bridge

Part number

VBO125-16N07



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

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

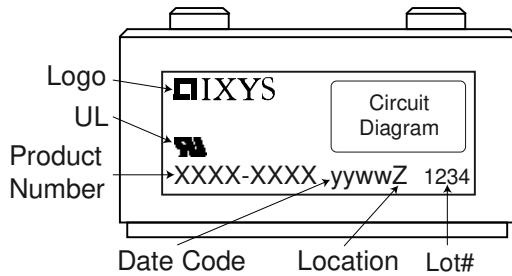
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Rectifier				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
V_{RSM}	max. non-repetitive reverse blocking voltage					1700	V
V_{RRM}	max. repetitive reverse blocking voltage					1600	V
I_R	reverse current	$V_R = 1600$ V		$T_{VJ} = 25^\circ\text{C}$		200	μA
		$V_R = 1600$ 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
		$I_F = 100$ A				1.21	V
		$I_F = 50$ A		$T_{VJ} = 125^\circ\text{C}$		0.97	V
		$I_F = 100$ A				1.15	V
I_{DAV}	bridge output current	$T_C = 105^\circ\text{C}$		$T_{VJ} = 150^\circ\text{C}$		125	A
		rectangular	d = 0.5				
V_{FO}	threshold voltage			$T_{VJ} = 150^\circ\text{C}$		0.76	V
r_F	slope resistance					3.6	m Ω
						} for power loss calculation only	
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		$V_R = 0$ V		1.95	kA
		t = 10 ms; (50 Hz), sine		$T_{VJ} = 150^\circ\text{C}$		1.53	kA
		t = 8,3 ms; (60 Hz), sine		$V_R = 0$ V		1.65	kA
I^2t	value for fusing	t = 10 ms; (50 Hz), sine		$T_{VJ} = 45^\circ\text{C}$		16.2	kA ² s
		t = 8,3 ms; (60 Hz), sine		$V_R = 0$ V		15.7	kA ² s
		t = 10 ms; (50 Hz), sine		$T_{VJ} = 150^\circ\text{C}$		11.7	kA ² s
		t = 8,3 ms; (60 Hz), sine		$V_R = 0$ V		11.3	kA ² 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_{VJ}	virtual junction temperature		-40		150	°C
T_{op}	operation temperature		-40		125	°C
T_{stg}	storage temperature		-40		125	°C
Weight				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	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	VBO125-16NO7	VBO125-16NO7	Box	10	470791

Equivalent Circuits for Simulation

* on die level

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

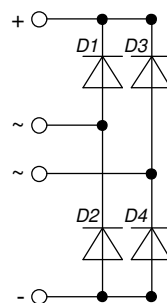
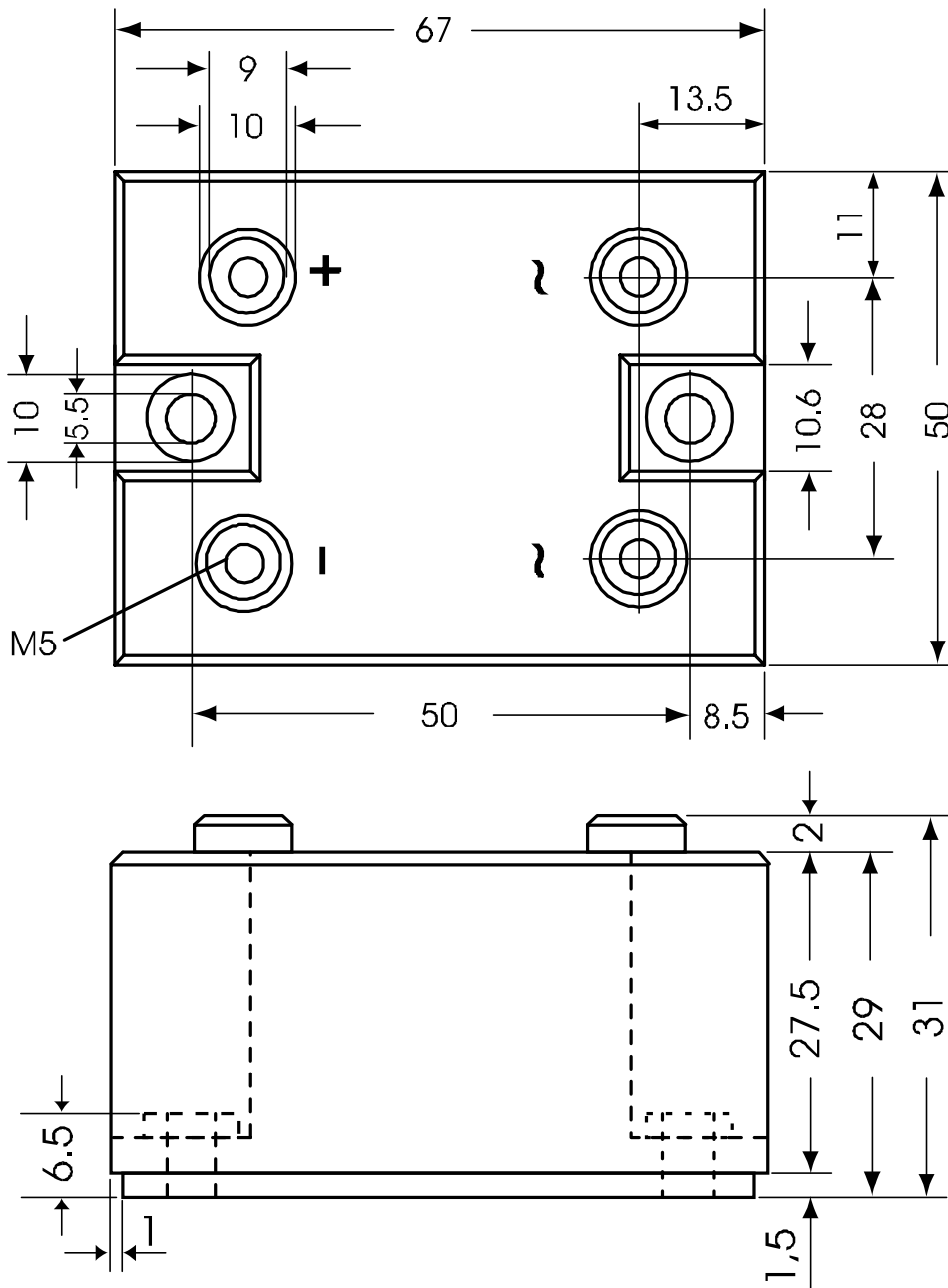


Rectifier

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



Outlines PWS-C





Rectifier

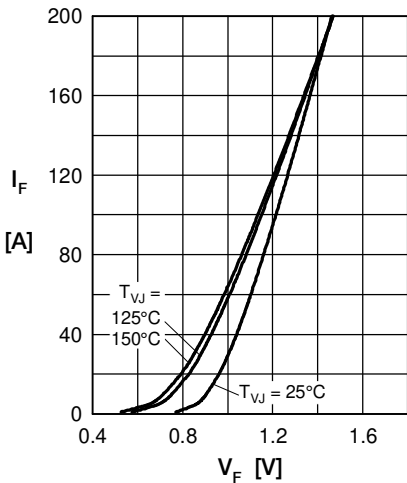


Fig. 1 Forward current versus voltage drop per diode

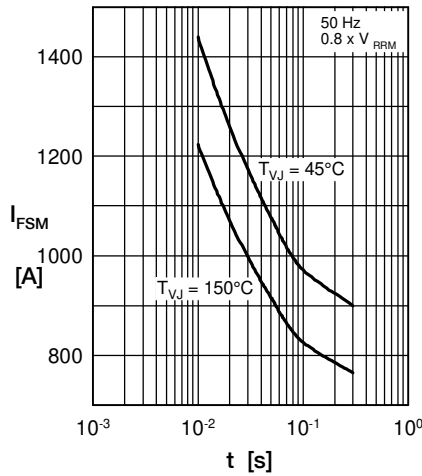


Fig. 2 Surge overload current vs. time per diode

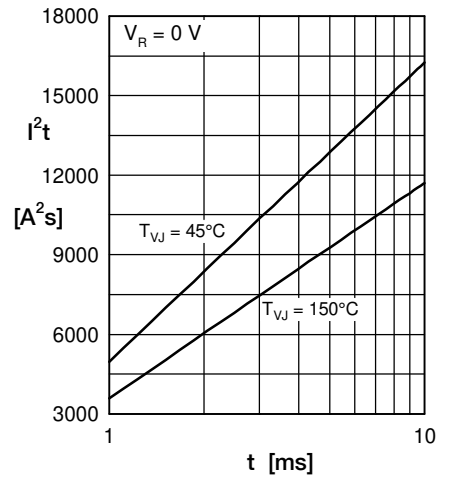


Fig. 3 I^2t versus time per diode

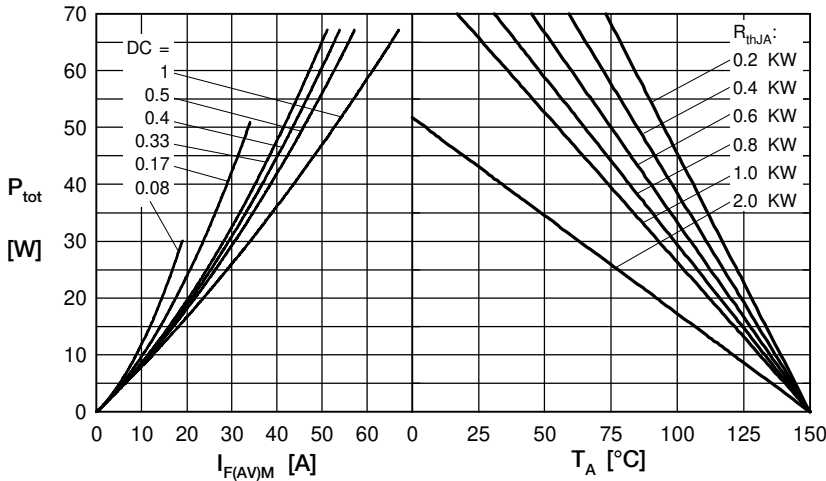


Fig. 4 Power dissipation vs. forward current and ambient temperature per diode

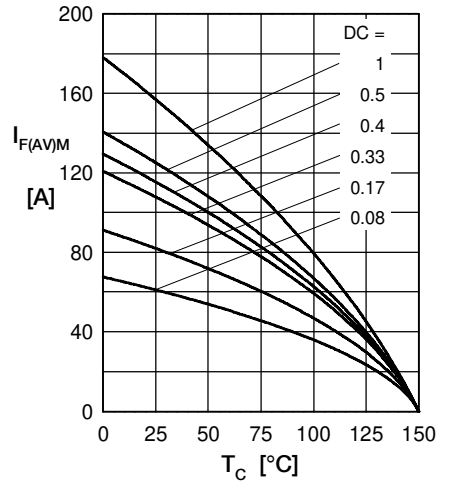


Fig. 5 Max. forward current vs. case temperature per diode

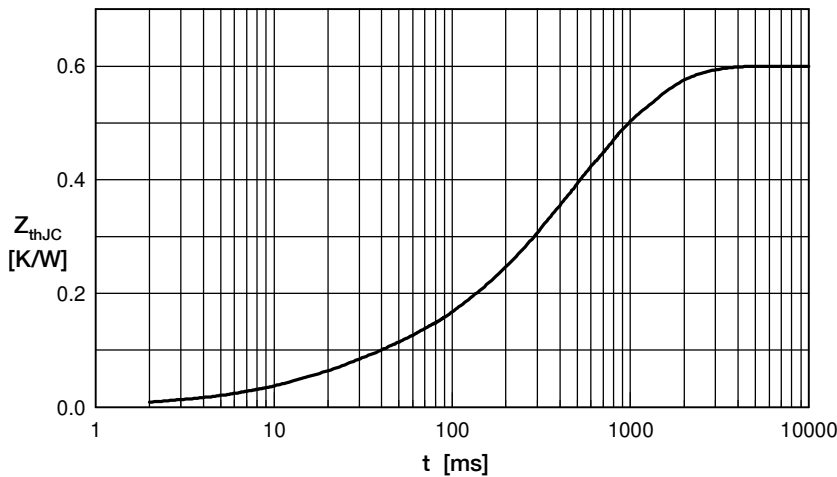


Fig. 6 Transient thermal impedance junction to case vs. time per diode

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

