

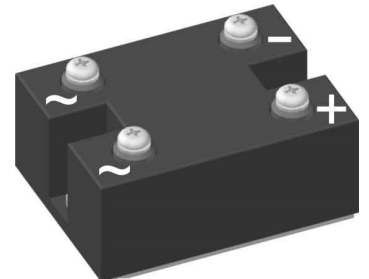
Standard Rectifier Module

1~ Rectifier
$V_{RRM} = 1200\text{ V}$
$I_{DAV} = 100\text{ A}$
$I_{FSM} = 1500\text{ A}$

1~ Rectifier Bridge

Part number

VBO105-12NO7



 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: 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

Disclaimer Notice

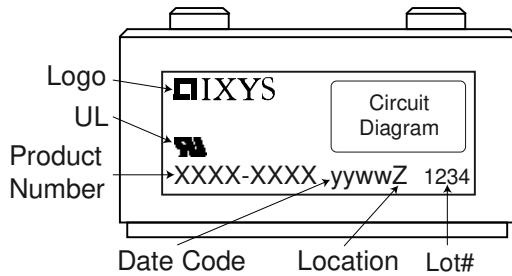
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Rectifier				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
V_{RSM}	max. non-repetitive reverse blocking voltage					1300	V
V_{RRM}	max. repetitive reverse blocking voltage					1200	V
I_R	reverse current	$V_R = 1200$ V		$T_{VJ} = 25^\circ\text{C}$		100	μA
		$V_R = 1200$ V		$T_{VJ} = 150^\circ\text{C}$		2	mA
V_F	forward voltage drop	$I_F = 40$ A		$T_{VJ} = 25^\circ\text{C}$		1.09	V
		$I_F = 80$ A				1.24	V
		$I_F = 40$ A		$T_{VJ} = 125^\circ\text{C}$		1.00	V
		$I_F = 80$ A				1.19	V
I_{DAV}	bridge output current	$T_C = 100^\circ\text{C}$		$T_{VJ} = 150^\circ\text{C}$		100	A
		rectangular	$d = 0.5$				
V_{FO}	threshold voltage			$T_{VJ} = 150^\circ\text{C}$		0.78	V
r_F	slope resistance					4.8	$\text{m}\Omega$
						} for power loss calculation only	
R_{thJC}	thermal resistance junction to case					0.8	K/W
R_{thCH}	thermal resistance case to heatsink				0.3		K/W
P_{tot}	total power dissipation			$T_C = 25^\circ\text{C}$		155	W
I_{FSM}	max. forward surge current	$t = 10$ ms; (50 Hz), sine		$T_{VJ} = 45^\circ\text{C}$		1.50	kA
		$t = 8,3$ ms; (60 Hz), sine		$V_R = 0$ V		1.62	kA
		$t = 10$ ms; (50 Hz), sine		$T_{VJ} = 150^\circ\text{C}$		1.28	kA
		$t = 8,3$ ms; (60 Hz), sine		$V_R = 0$ V		1.38	kA
I^2t	value for fusing	$t = 10$ ms; (50 Hz), sine		$T_{VJ} = 45^\circ\text{C}$		11.3	kA^2s
		$t = 8,3$ ms; (60 Hz), sine		$V_R = 0$ V		10.9	kA^2s
		$t = 10$ ms; (50 Hz), sine		$T_{VJ} = 150^\circ\text{C}$		8.13	kA^2s
		$t = 8,3$ ms; (60 Hz), sine		$V_R = 0$ V		7.87	kA^2s
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	VBO105-12NO7	VBO105-12NO7	Box	10	470783

Equivalent Circuits for Simulation

* on die level

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

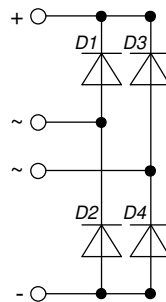
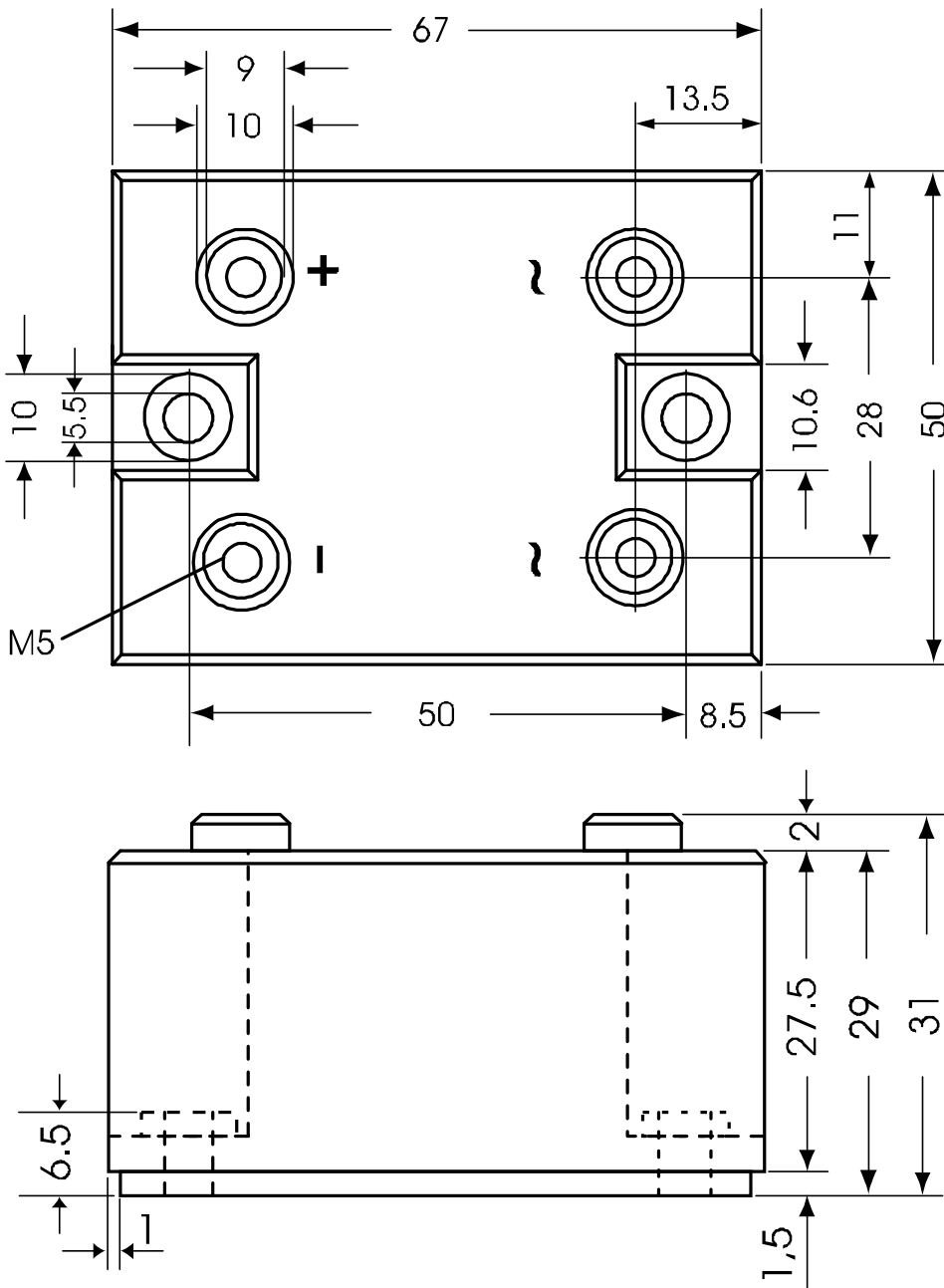


Rectifier

$V_{0\ max}$	threshold voltage	0.78	V
$R_{0\ max}$	slope resistance *	3.6	mΩ



Outlines PWS-C





Rectifier

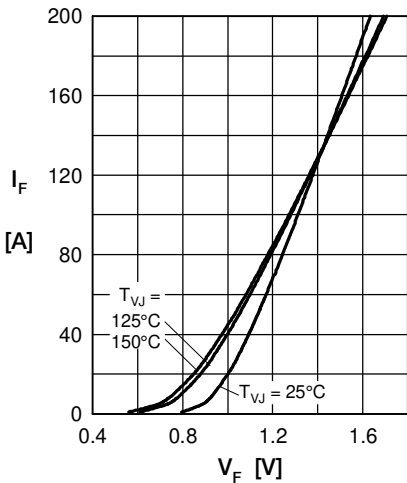


Fig. 1 Forward current versus voltage drop per diode

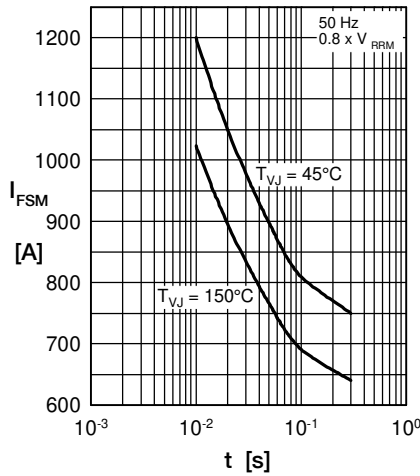


Fig. 2 Surge overload current vs. time per diode

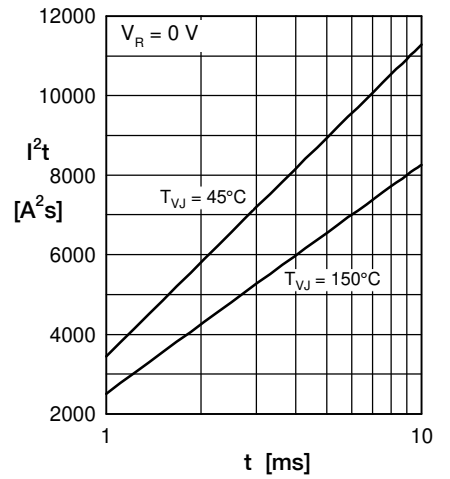


Fig. 3 I^2t versus time per diode

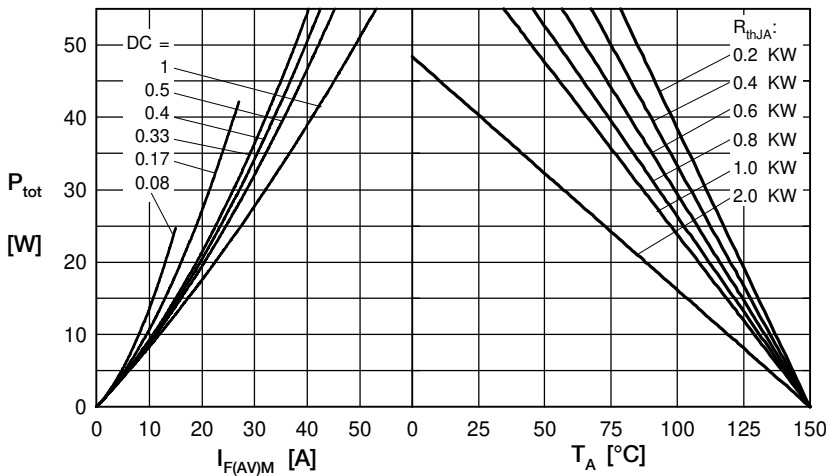


Fig. 4 Power dissipation vs. forward current and ambient temperature per diode

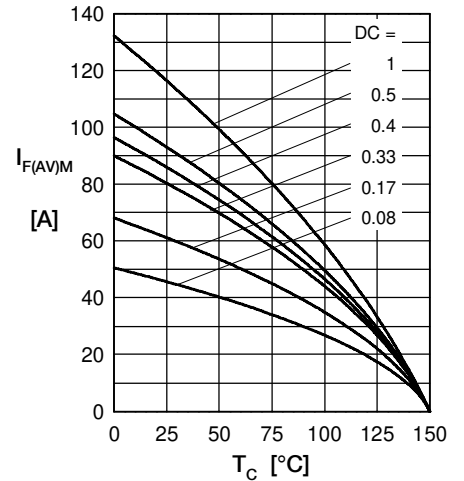


Fig. 5 Max. forward current vs. case temperature per diode

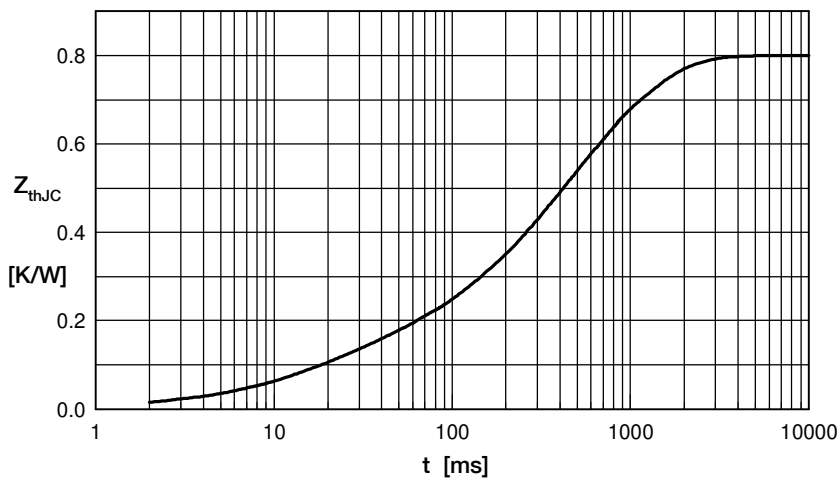


Fig. 6 Transient thermal impedance junction to case vs. time per diode

Constants for Z_{thJC} calculation:

i	R_{th} (K/W)	t_i (s)
1	0.100	0.020
2	0.014	0.010
3	0.192	0.225
4	0.281	0.800
5	0.213	0.580

