

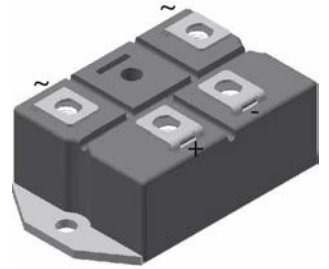
Standard Rectifier Module


1~ Rectifier	
V_{RRM}	= 1200 V
I_{DAV}	= 60 A
I_{FSM}	= 550 A

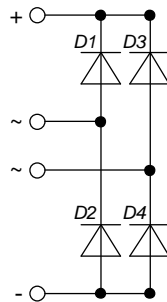
1~ Rectifier Bridge

Part number

VBO52-12N07



 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

Disclaimer Notice

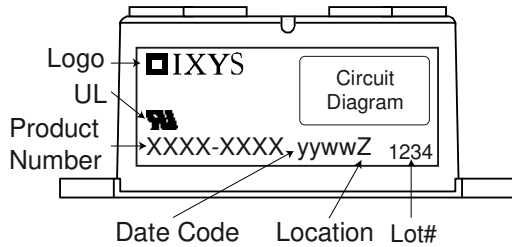
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Rectifier				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
V_{RSM}	max. non-repetitive reverse blocking voltage					1300	V
V_{RRM}	max. repetitive reverse blocking voltage					1200	V
I_R	reverse current	$V_R = 1200\text{ V}$	$T_{VJ} = 25^\circ\text{C}$			40	μA
		$V_R = 1200\text{ V}$	$T_{VJ} = 150^\circ\text{C}$			1,5	mA
V_F	forward voltage drop	$I_F = 20\text{ A}$	$T_{VJ} = 25^\circ\text{C}$			1,07	V
		$I_F = 40\text{ A}$				1,19	V
		$I_F = 20\text{ A}$	$T_{VJ} = 125^\circ\text{C}$			0,96	V
		$I_F = 40\text{ A}$				1,13	V
I_{DAV}	bridge output current	$T_C = 115^\circ\text{C}$ rectangular	$T_{VJ} = 150^\circ\text{C}$			60	A
V_{FO}	threshold voltage	} for power loss calculation only				0,78	V
r_F	slope resistance					8,1	m Ω
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	$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}$	$T_{VJ} = 45^\circ\text{C}$			550	A
		$t = 8,3\text{ ms}; (60\text{ Hz}), \text{ sine}$	$V_R = 0\text{ V}$			595	A
		$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}$	$T_{VJ} = 150^\circ\text{C}$			470	A
		$t = 8,3\text{ ms}; (60\text{ Hz}), \text{ sine}$	$V_R = 0\text{ V}$			505	A
I^2t	value for fusing	$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}$	$T_{VJ} = 45^\circ\text{C}$			1,52	kA ² s
		$t = 8,3\text{ ms}; (60\text{ Hz}), \text{ sine}$	$V_R = 0\text{ V}$			1,48	kA ² s
		$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}$	$T_{VJ} = 150^\circ\text{C}$			1,11	kA ² s
		$t = 8,3\text{ ms}; (60\text{ Hz}), \text{ sine}$	$V_R = 0\text{ V}$			1,06	kA ² s
C_J	junction capacitance	$V_R = 400\text{ V}; f = 1\text{ MHz}$	$T_{VJ} = 25^\circ\text{C}$		19		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	3000			V
		t = 1 minute	2500			V

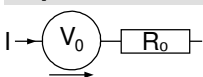


Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	VBO52-12NO7	VBO52-12NO7	Box	10	472344

Equivalent Circuits for Simulation

* on die level

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

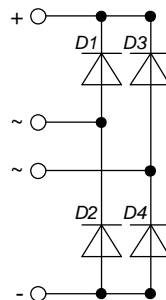
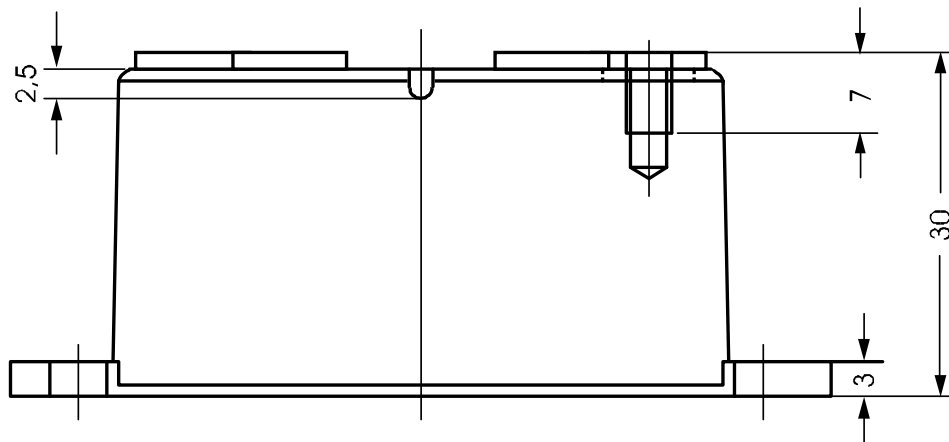
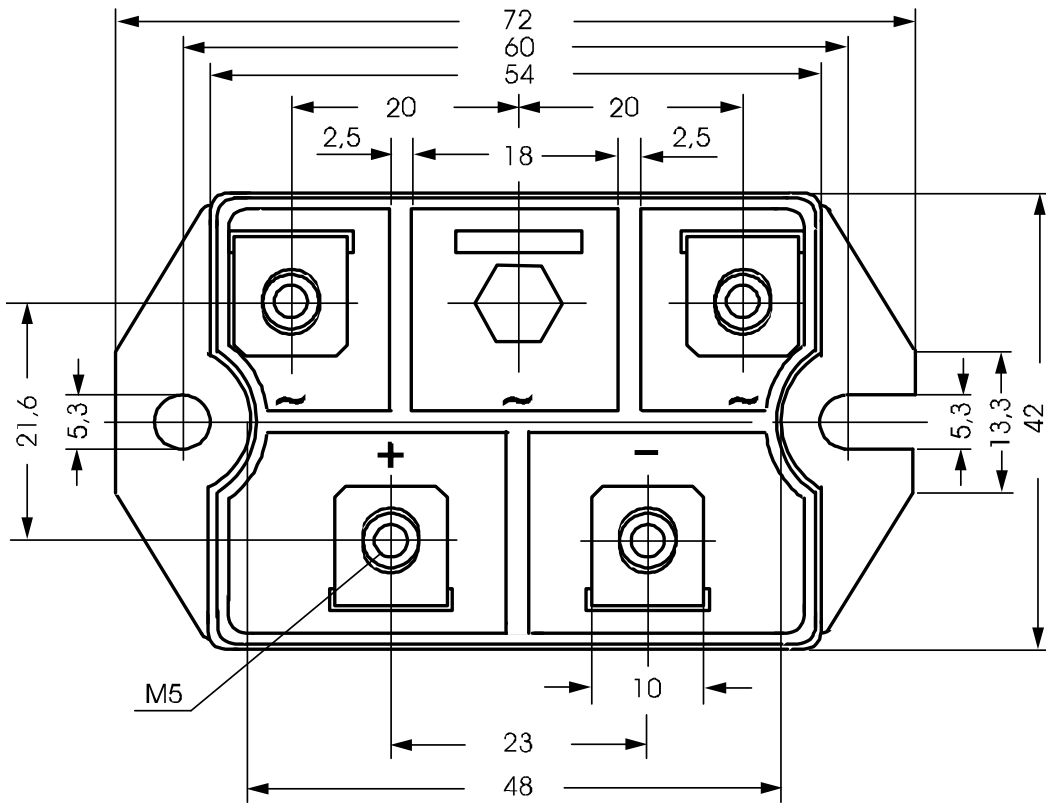


Rectifier

$V_{0\ max}$	threshold voltage	0,78	V
$R_{0\ max}$	slope resistance *	6,9	mΩ



Outlines PWS-D





Rectifier

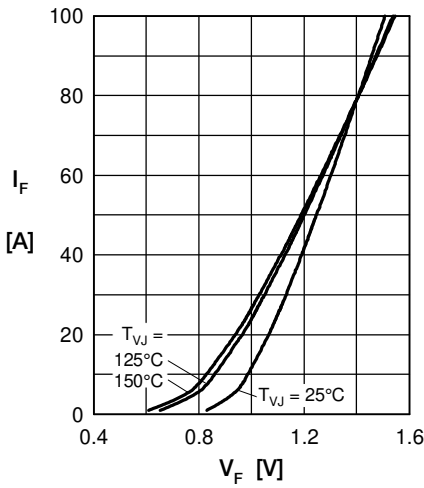


Fig. 1 Forward current vs. voltage drop per diode

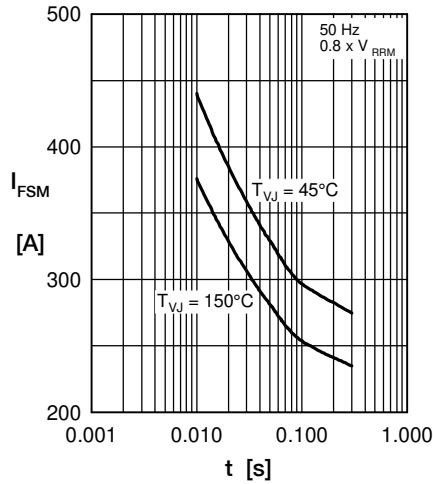


Fig. 2 Surge overload current vs. time per diode

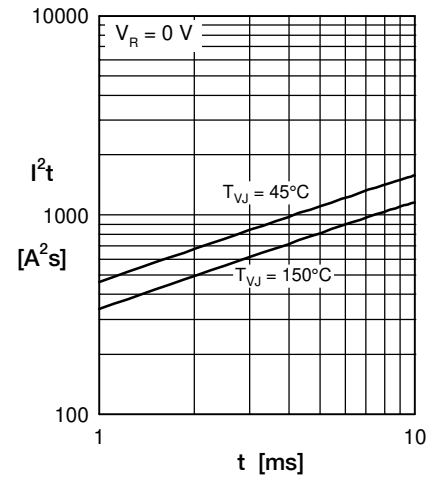


Fig. 3 I^2t vs. time per diode

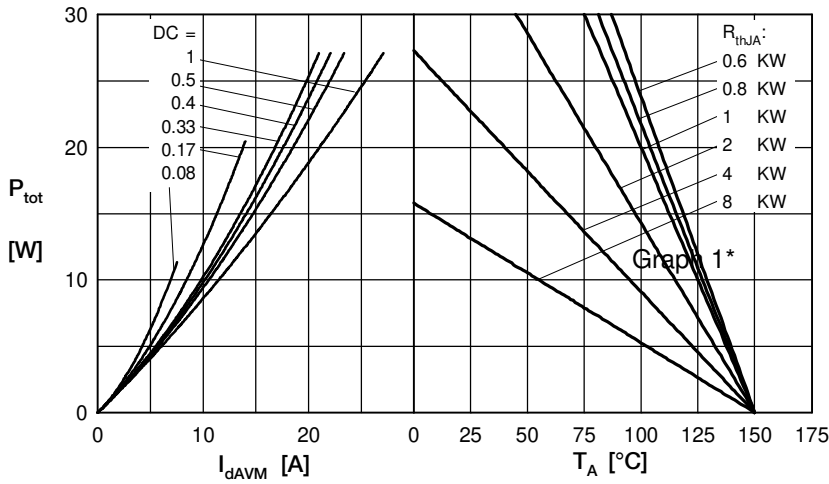


Fig. 4 Power dissipation vs. forward current and ambient temperature per diode

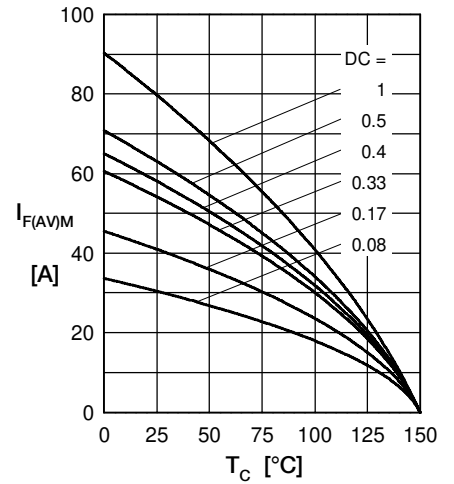


Fig. 5 Max. forward current vs. case temperature per diode

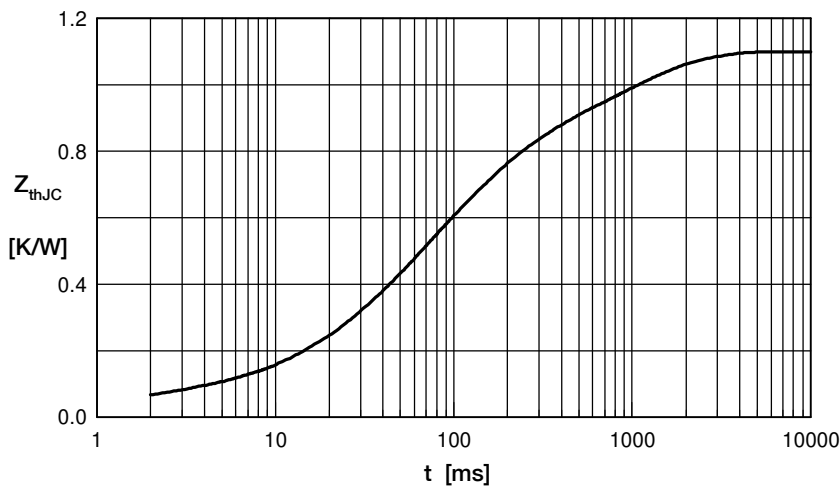


Fig. 6 Transient thermal impedance junction to case vs. time per diode

Constants for Z_{thJC} calculation:

i	R_{th} (K/W)	t_i (s)
1	0.05	0.001
2	0.14	0.030
3	0.25	0.060
4	0.35	0.130
5	0.31	0.920