

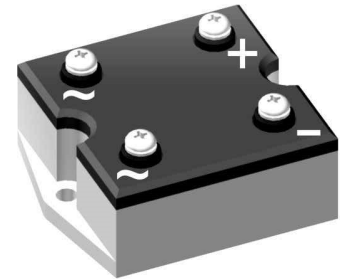
Standard Rectifier Module

1~ Rectifier	
V_{RRM}	= 1600 V
I_{DAV}	= 25 A
I_{FSM}	= 400 A

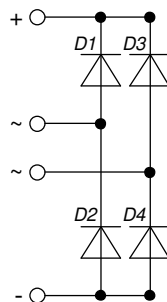
1~ Rectifier Bridge

Part number

VBO30-16NO7



 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-A

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

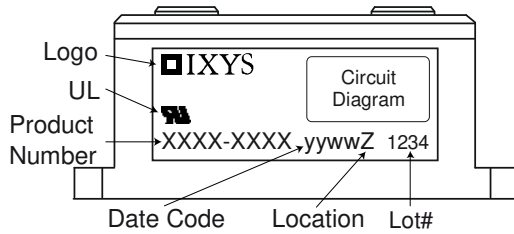
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Rectifier				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
V_{RSM}	max. non-repetitive reverse blocking voltage					1700	V
V_{RRM}	max. repetitive reverse blocking voltage					1600	V
I_R	reverse current	$V_R = 1600$ V	$T_{VJ} = 25^\circ\text{C}$			40	μA
		$V_R = 1600$ V	$T_{VJ} = 150^\circ\text{C}$			1.5	mA
V_F	forward voltage drop	$I_F = 15$ A	$T_{VJ} = 25^\circ\text{C}$			1.10	V
		$I_F = 30$ A				1.25	V
		$I_F = 15$ A	$T_{VJ} = 125^\circ\text{C}$			1.01	V
		$I_F = 30$ A				1.21	V
I_{DAV}	bridge output current	$T_C = 85^\circ\text{C}$ rectangular	$T_{VJ} = 150^\circ\text{C}$ d = 0.5			25	A
V_{F0}	threshold voltage	} for power loss calculation only				0.80	V
r_F	slope resistance					12.9	m Ω
R_{thJC}	thermal resistance junction to case					4.2	K/W
R_{thCH}	thermal resistance case to heatsink				0.6		K/W
P_{tot}	total power dissipation			$T_C = 25^\circ\text{C}$		29	W
I_{FSM}	max. forward surge current	t = 10 ms; (50 Hz), sine	$T_{VJ} = 45^\circ\text{C}$			400	A
		t = 8,3 ms; (60 Hz), sine	$V_R = 0$ V			430	A
		t = 10 ms; (50 Hz), sine	$T_{VJ} = 150^\circ\text{C}$			340	A
		t = 8,3 ms; (60 Hz), sine	$V_R = 0$ V			365	A
I^2t	value for fusing	t = 10 ms; (50 Hz), sine	$T_{VJ} = 45^\circ\text{C}$			800	A ² s
		t = 8,3 ms; (60 Hz), sine	$V_R = 0$ V			770	A ² s
		t = 10 ms; (50 Hz), sine	$T_{VJ} = 150^\circ\text{C}$			580	A ² s
		t = 8,3 ms; (60 Hz), sine	$V_R = 0$ V			555	A ² s
C_J	junction capacitance	$V_R = 400$ V; f = 1 MHz	$T_{VJ} = 25^\circ\text{C}$		10		pF



Package PWS-A				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					104	g	
M_D	mounting torque		1.25		1.75	Nm	
M_T	terminal torque		1.25		1.75	Nm	
$d_{Spp/App}$	creepage distance on surface striking distance through air	terminal to terminal	6.5			mm	
$d_{Spb/Apb}$		terminal to backside	8.5			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	VBO30-16NO7	VBO30-16NO7	Box	20	470627

Equivalent Circuits for Simulation

* on die level

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

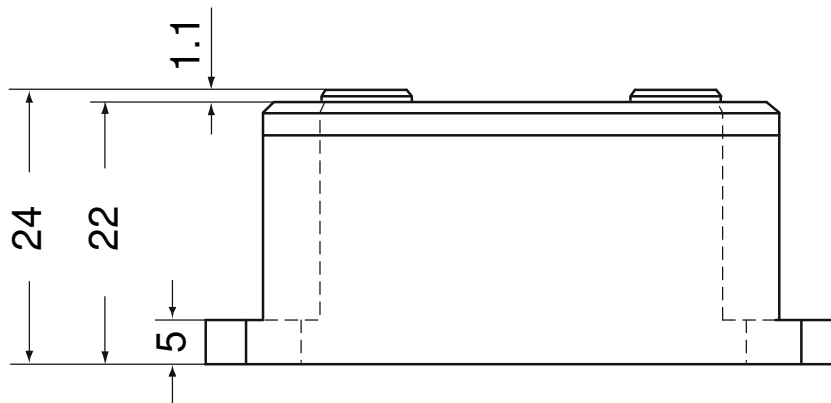
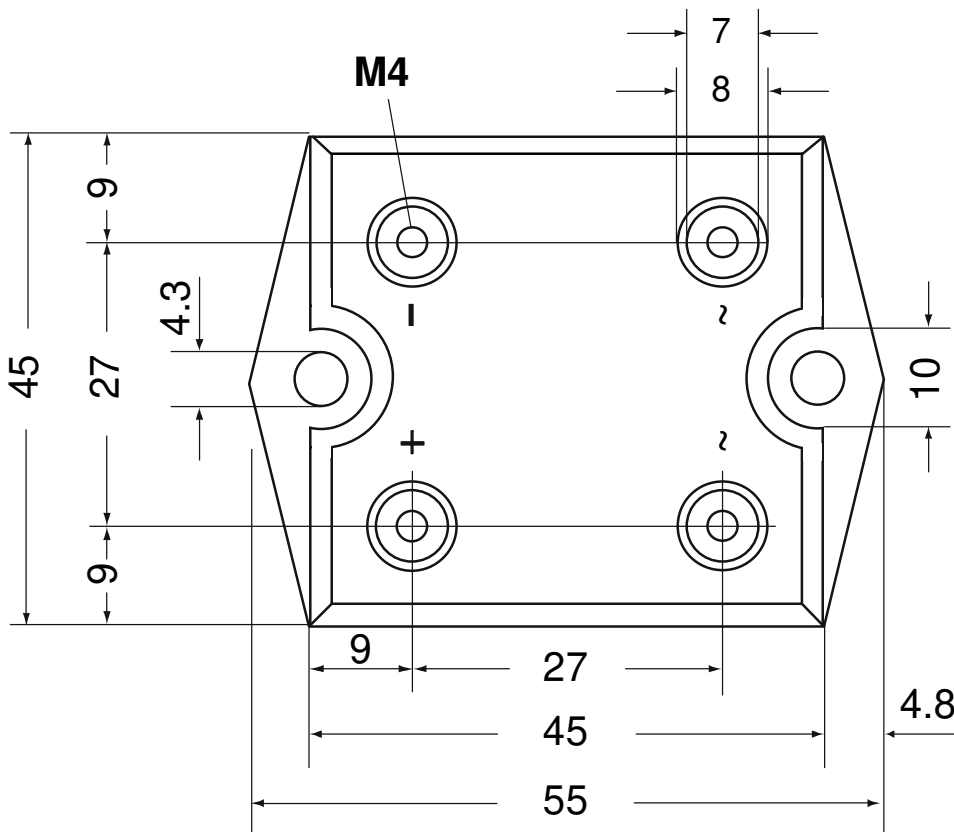


Rectifier

$V_{0\ max}$	threshold voltage	0.8	V
$R_{0\ max}$	slope resistance *	11.7	mΩ



Outlines PWS-A



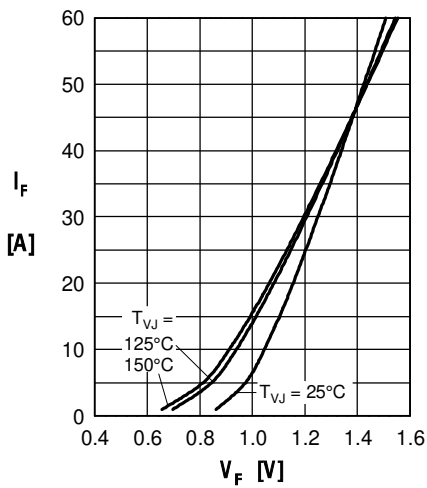
Rectifier


Fig. 1 Forward current vs. voltage drop per diode

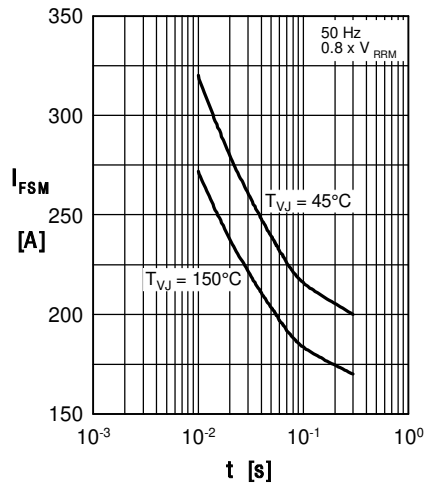


Fig. 2 Surge overload current vs. time per diode

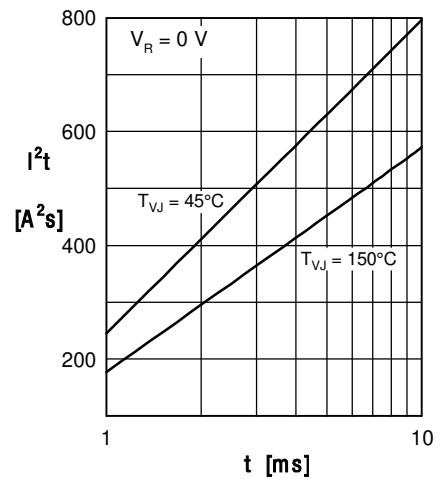
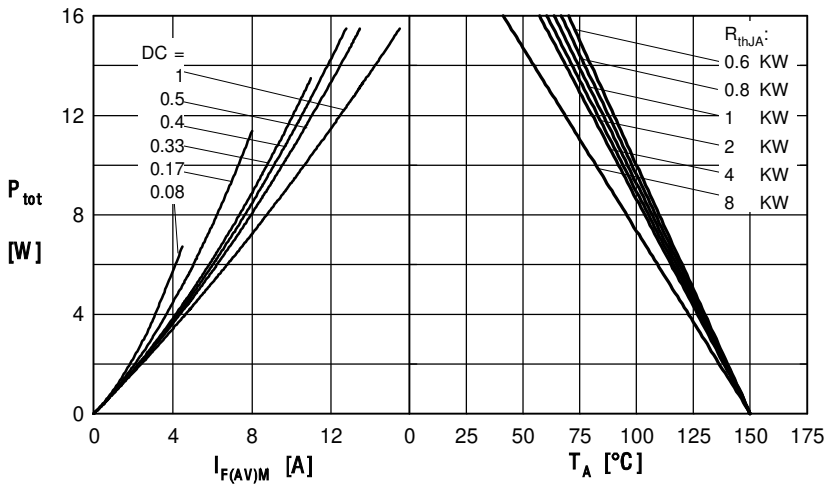

 Fig. 3 I^2t vs. time per diode


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

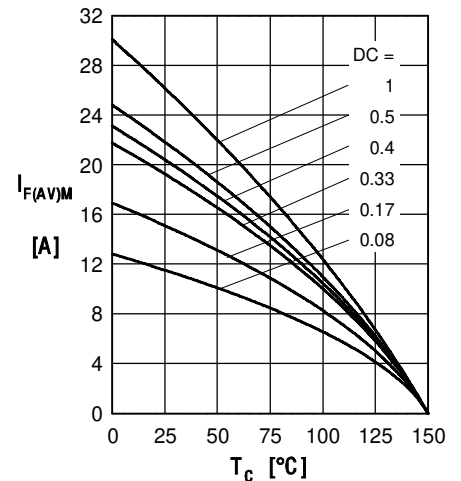


Fig. 5 Max. forward current vs. case temperature per diode

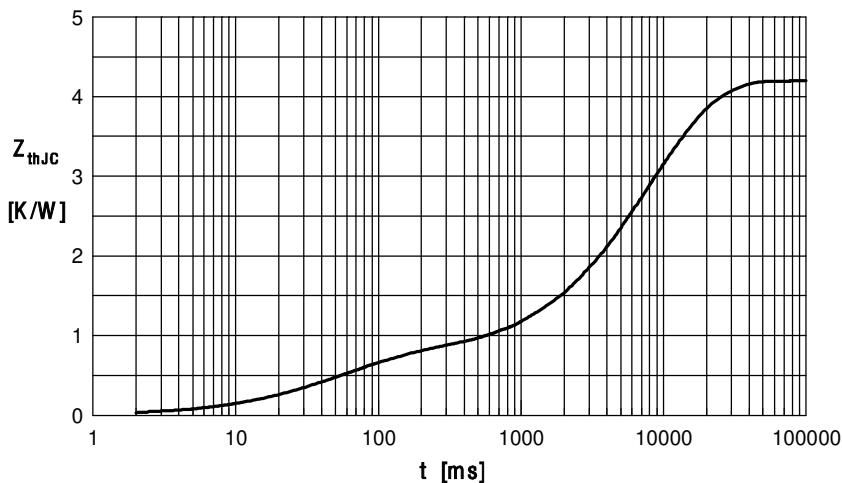


Fig. 6 Transient thermal impedance junction to case vs. time per diode

 Constants for Z_{thJC} calculation:

i	R_{th} (K/W)	t_i (s)
1	0.194	0.024
2	0.556	0.070
3	0.450	3.250
4	3.000	9.300