

## Standard Rectifier Module

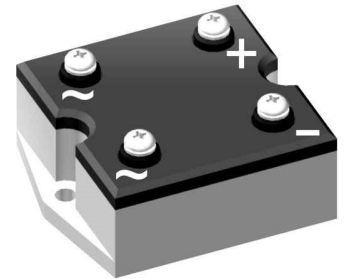
# PHASE OUT

1~ Rectifier Bridge

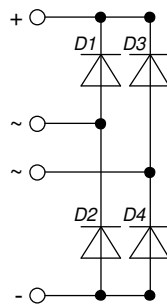
<b>1~ Rectifier</b>	
$V_{RRM}$	= 1600 V
$I_{DAV}$	= 25 A
$I_{FSM}$	= 400 A

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

Recommended replacement: VBO40-16NO6, VBO52-16NO7

### Disclaimer Notice

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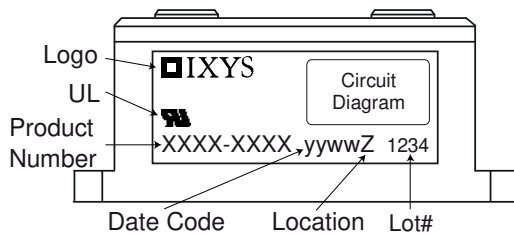
Rectifier				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
$V_{RSM}$	max. non-repetitive reverse blocking voltage					1700	V
$V_{RRM}$	max. repetitive reverse blocking voltage					1600	V
$I_R$	reverse current	$V_R = 1600$ V	$T_{VJ} = 25^\circ\text{C}$			40	$\mu\text{A}$
		$V_R = 1600$ 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
$V_{FO}$	threshold voltage	} for power loss calculation only				0.80	V
$r_F$	slope resistance					12.9	m $\Omega$
$R_{thJC}$	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 <sup>2</sup> s
		t = 8,3 ms; (60 Hz), sine	$V_R = 0$ V			770	A <sup>2</sup> s
		t = 10 ms; (50 Hz), sine	$T_{VJ} = 150^\circ\text{C}$			580	A <sup>2</sup> s
		t = 8,3 ms; (60 Hz), sine	$V_R = 0$ V			555	A <sup>2</sup> s
$C_J$	junction capacitance	$V_R = 400$ V; f = 1 MHz	$T_{VJ} = 25^\circ\text{C}$		10		pF

**PHASE OUT**



Phase out

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
<b>Weight</b>				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
		50/60 Hz, RMS; $I_{ISOL} \leq 1$ mA				



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

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

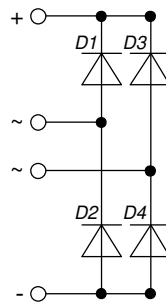
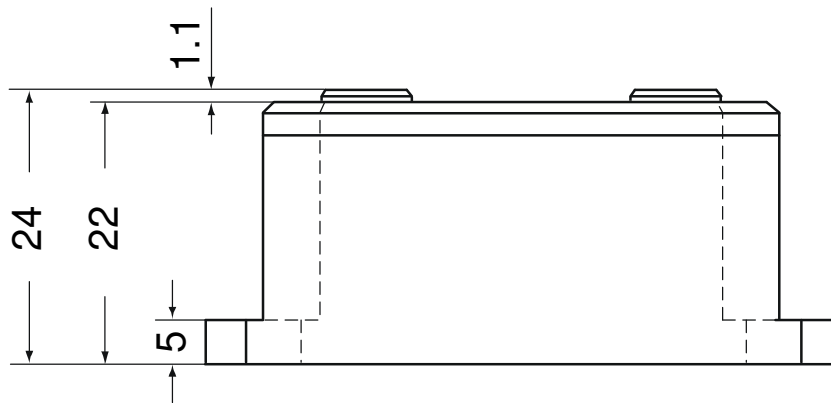
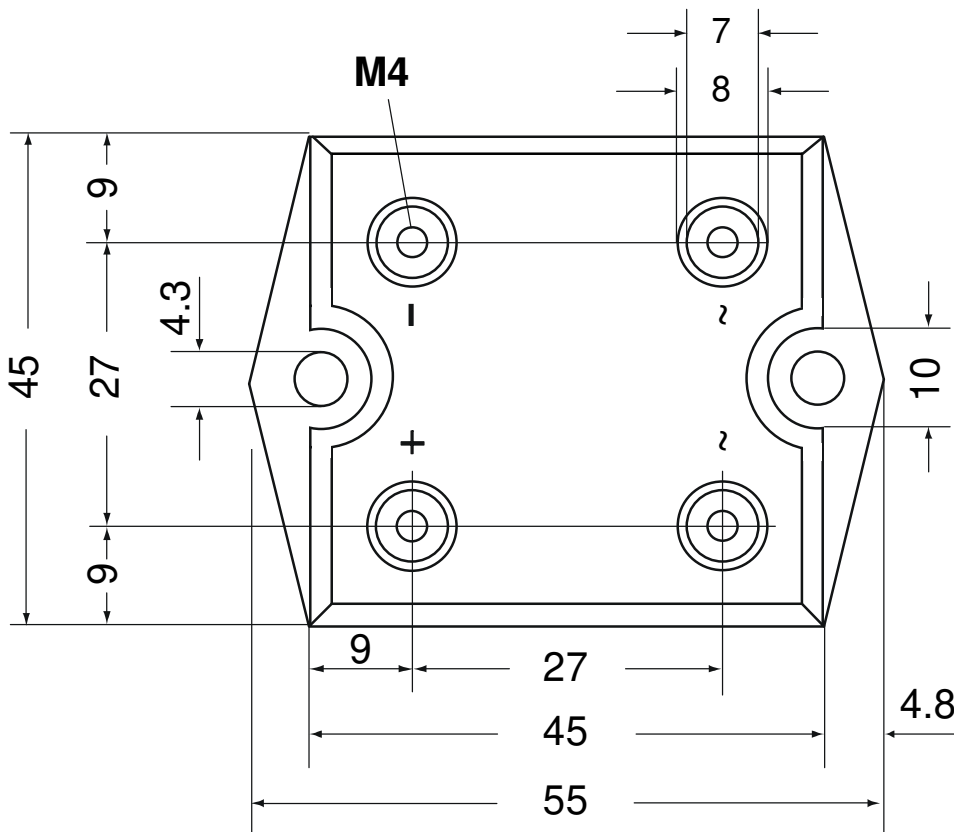


**Rectifier**

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



Outlines PWS-A





**Rectifier**

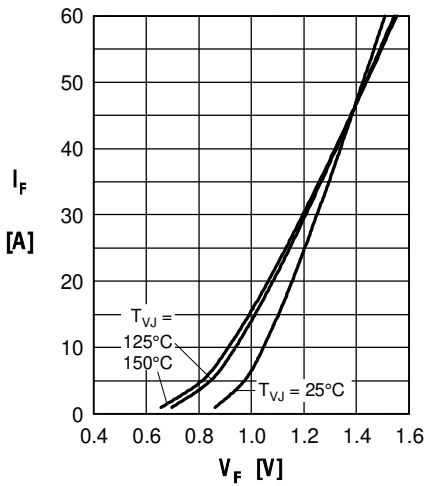


Fig. 1 Forward current vs. voltage drop per diode

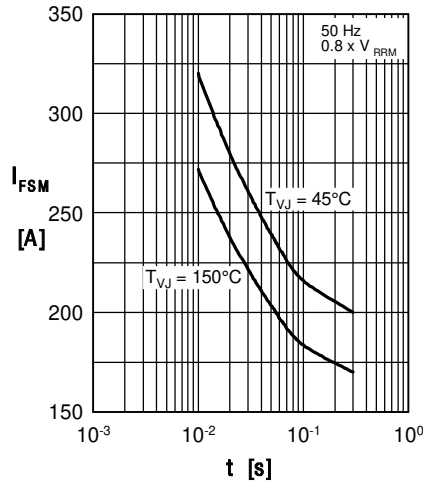


Fig. 2 Surge overload current vs. time per diode

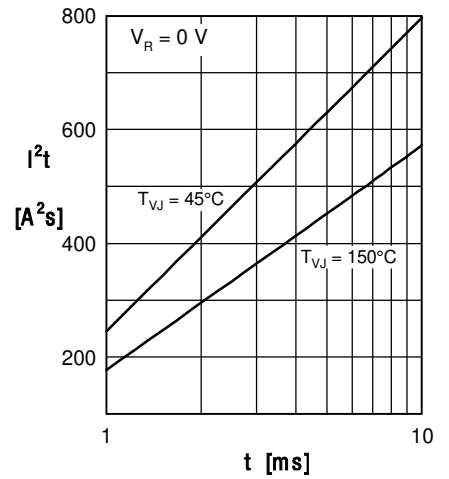


Fig. 3  $I^2t$  vs. time per diode

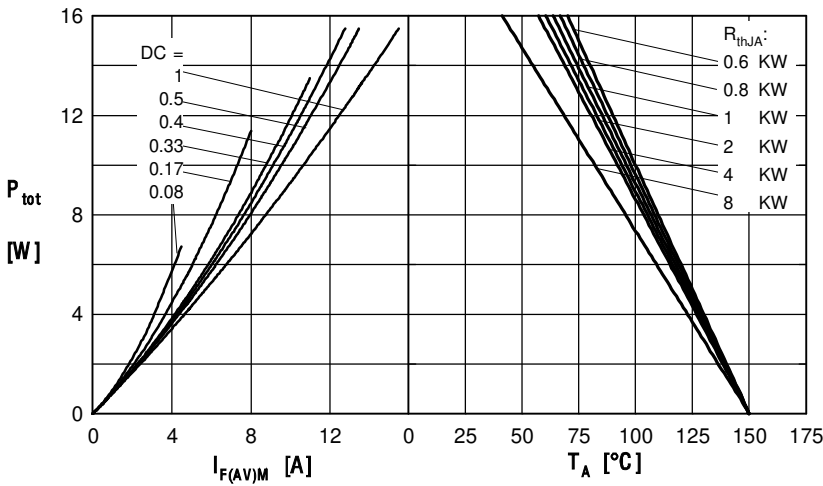


Fig. 4 Power dissipation vs. forward current and ambient temperature per diode

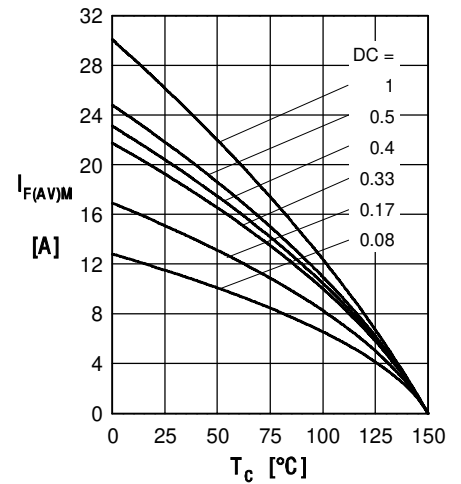


Fig. 5 Max. forward current vs. case temperature per diode

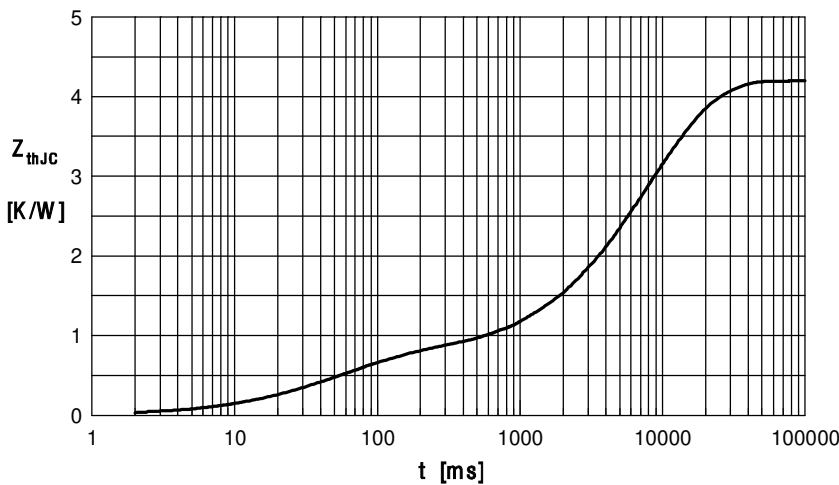


Fig. 6 Transient thermal impedance junction to case vs. time per diode

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