

Avalanche Rectifier Module

$$V_{RRM} = 1600\text{ V}$$

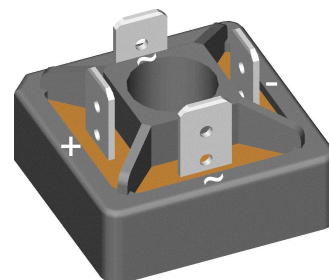
$$I_{FAV} = 25\text{ A}$$

$$V_F = 1.13\text{ V}$$

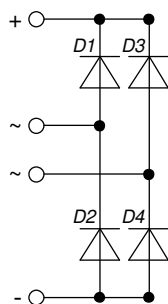
1~ Rectifier Bridge

Part number

VBO25-16AO2



 E72873



Features / Advantages:

- Planar passivated chips
- Very low leakage current
- Very low forward voltage drop
- Improved thermal behaviour

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: FO-A

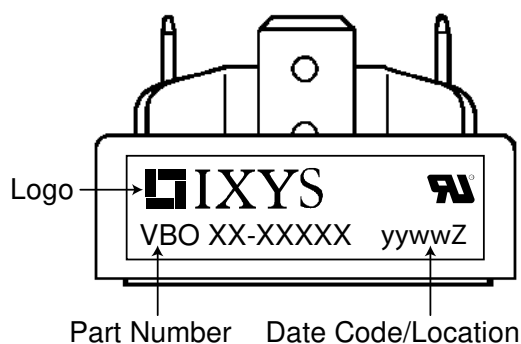
- Isolation Voltage: 3000 V~
- Industry standard outline
- RoHS compliant
- 1/4" fast-on terminals
- Easy to mount with one screw

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Rectifier				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
V_{RSM}	max. non-repetitive reverse blocking voltage	$T_{VJ} = 25^{\circ}\text{C}$				1700	V
V_{RRM}	max. repetitive reverse blocking voltage	$T_{VJ} = 25^{\circ}\text{C}$				1600	V
I_R	reverse current	$V_R = 1600\text{ V}$	$T_{VJ} = 25^{\circ}\text{C}$			100	μA
		$V_R = 1600\text{ V}$	$T_{VJ} = 150^{\circ}\text{C}$			1	mA
V_F	forward voltage drop	$I_F = 25\text{ A}$	$T_{VJ} = 25^{\circ}\text{C}$			1.18	V
		$I_F = 50\text{ A}$				1.37	V
		$I_F = 25\text{ A}$	$T_{VJ} = 125^{\circ}\text{C}$			1.13	V
		$I_F = 50\text{ A}$				1.37	V
I_{DAV}	bridge output current	$T_C = 125^{\circ}\text{C}$ rectangular $d = 0.5$	$T_{VJ} = 150^{\circ}\text{C}$			25	A
V_{F0}	threshold voltage	} for power loss calculation only	$T_{VJ} = 150^{\circ}\text{C}$			0.88	V
r_F	slope resistance					9.6	m Ω
R_{thJC}	thermal resistance junction to case					2	K/W
R_{thCH}	thermal resistance case to heatsink				0.4		K/W
P_{tot}	total power dissipation		$T_C = 25^{\circ}\text{C}$			60	W
I_{FSM}	max. forward surge current	$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}$	$T_{VJ} = 45^{\circ}\text{C}$			370	A
		$t = 8,3\text{ ms}; (60\text{ Hz}), \text{ sine}$	$V_R = 0\text{ V}$			400	A
		$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}$	$T_{VJ} = 150^{\circ}\text{C}$			315	A
		$t = 8,3\text{ ms}; (60\text{ Hz}), \text{ sine}$	$V_R = 0\text{ V}$			340	A
I^2t	value for fusing	$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}$	$T_{VJ} = 45^{\circ}\text{C}$			685	A ² s
		$t = 8,3\text{ ms}; (60\text{ Hz}), \text{ sine}$	$V_R = 0\text{ V}$			665	A ² s
		$t = 10\text{ ms}; (50\text{ Hz}), \text{ sine}$	$T_{VJ} = 150^{\circ}\text{C}$			495	A ² s
		$t = 8,3\text{ ms}; (60\text{ Hz}), \text{ sine}$	$V_R = 0\text{ V}$			480	A ² s
C_J	junction capacitance	$V_R = 400\text{ V}; f = 1\text{ MHz}$	$T_{VJ} = 25^{\circ}\text{C}$		11		pF
P_{RSM}	max. surge reverse dissipation	$t_p = 10\text{ }\mu\text{s}$	$T_{VJ} = 150^{\circ}\text{C}$			3.4	kW

Package FO-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					15		g
M _D	mounting torque			1.5		2	Nm
d _{Spp/App}	creepage distance on surface striking distance through air	terminal to terminal	13.0	9.5			mm
d _{Spt/Apb}		terminal to backside					mm
V _{ISOL}	isolation voltage	t = 1 second	50/60 Hz, RMS; I _{ISOL} ≤ 1 mA	3000			V
		t = 1 minute		2500			V

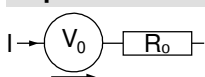


Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	VBO25-16AO2	VBO25-16AO2	Box	10	424463

Equivalent Circuits for Simulation

* on die level

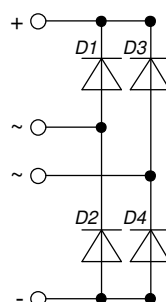
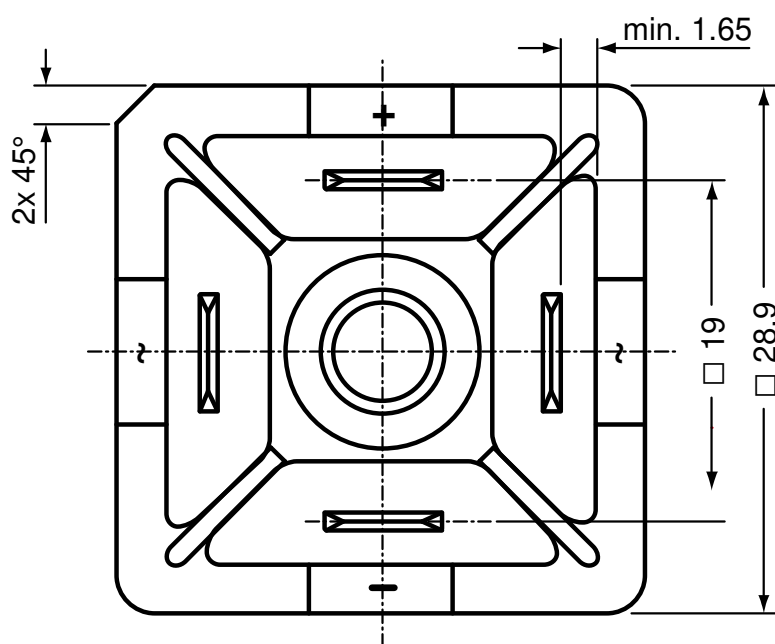
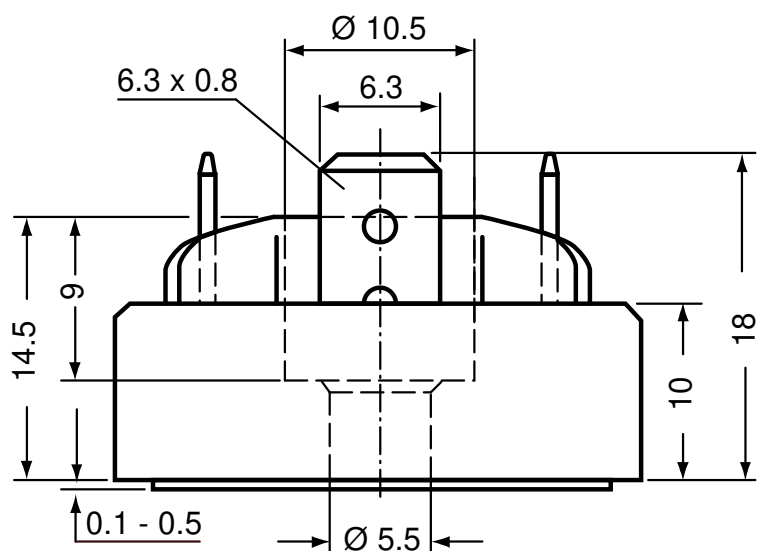
$T_{VJ} = 150^{\circ}\text{C}$



Rectifier

$V_{0\max}$	threshold voltage	0.88	V
$R_{0\max}$	slope resistance *	8.4	mΩ

Outlines FO-A



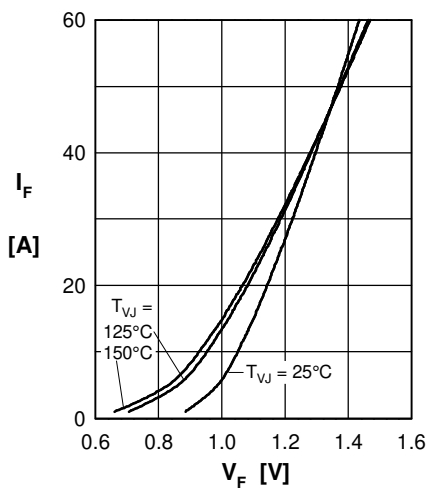
Rectifier


Fig. 1 Forward current vs. voltage drop per diode

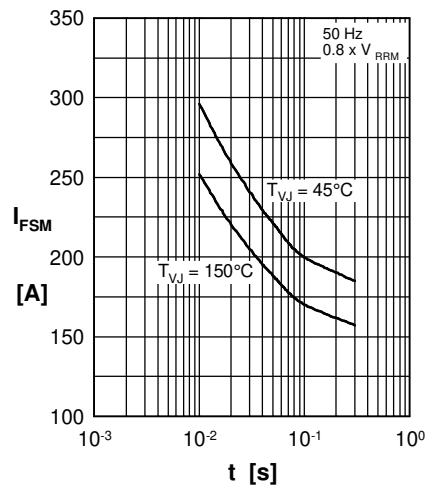


Fig. 2 Surge overload current vs. time per diode

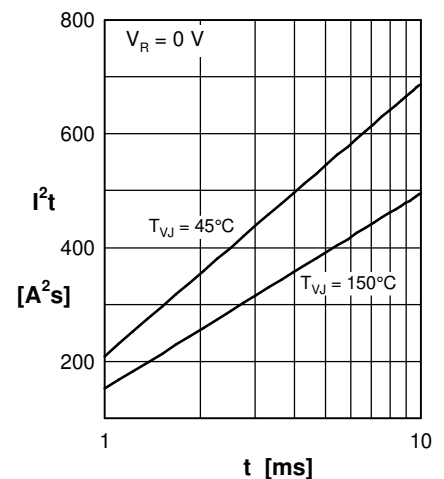


Fig. 3 I^2t vs. time per diode

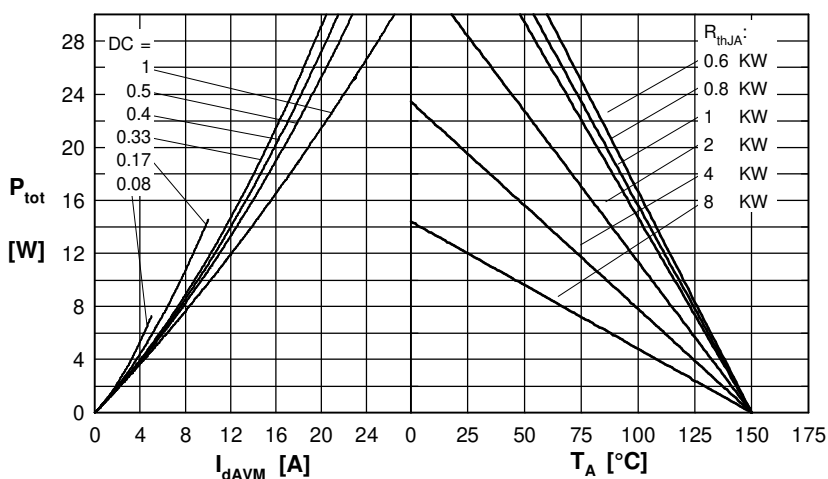


Fig. 4 Power dissipation vs. forward current and ambient temperature per diode

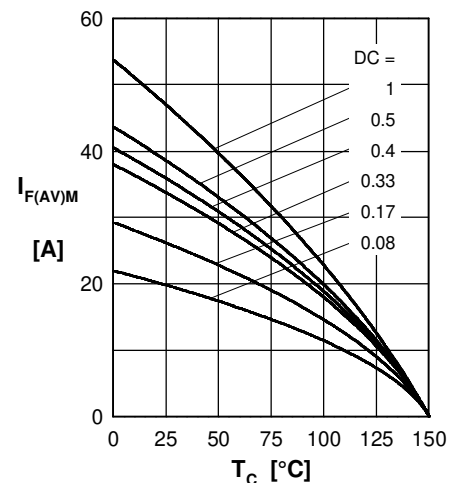


Fig. 5 Max. forward current vs. case temperature per diode

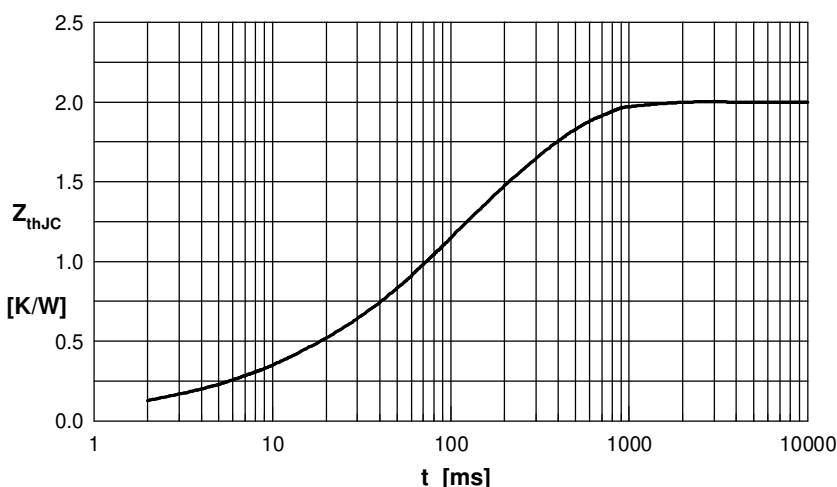


Fig. 6 Transient thermal impedance junction to case vs. time per diode

Constants for Z_{thJC} calculation:

i	R_{th} (K/W)	t_i (s)
1	0.061	0.001
2	0.203	0.008
3	0.500	0.250
4	0.703	0.060
5	0.533	0.300