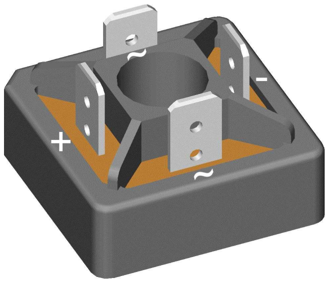
Standard Rectifier Module

1~ Rectifier		
V_{RRM}	=	1200 V
I_{DAV}	=	25 A
I_{FSM}	=	370 A

1~ Rectifier Bridge

Part number

VBO25-12NO2



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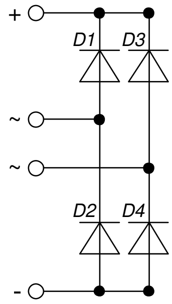

Features / Advantages:

- 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
- ¼" fast-on terminals
- Easy to mount with one screw

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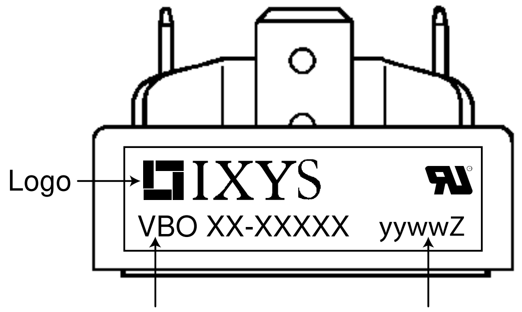
Rectifier

Symbol	Definition	Conditions		min.	typ.	max.	Unit
				Ratings			
V_{RSM}	*max. non-repetitive reverse blocking voltage*		T_{VJ} = 25°C			1300	V
V_{RRM}	*max. repetitive reverse blocking voltage*		T_{VJ} = 25°C			1200	V
I_R	*reverse current*	V_R = 1200 V	T_{VJ} = 25°C			100	µA
		V_R = 1200 V	T_{VJ} = 150°C			1	mA
V_F	*forward voltage drop*	I_F = 25 A	T_{VJ} = 25°C			1.18	V
		I_F = 50 A				1.37	V
		I_F = 25 A	T_{VJ} = 125°C			1.13	V
		I_F = 50 A				1.37	V
I_{DAV}	*bridge output current*	T_C = 125°C rectangular d = 0.5	T_{VJ} = 150°C			25	A
V_{F0}	*threshold voltage*	*for power loss calculation only*	T_{VJ} = 150°C			0.88	V
r_F	*slope resistance*					9.6	mΩ
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°C			60	W
I_{FSM}	*max. forward surge current*	t = 10 ms; (50 Hz), sine	T_{VJ} = 45°C			370	A
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			400	A
		t = 10 ms; (50 Hz), sine	T_{VJ} = 150°C			315	A
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			340	A
I^2t	*value for fusing*	t = 10 ms; (50 Hz), sine	T_{VJ} = 45°C			685	A^2s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			665	A^2s
		t = 10 ms; (50 Hz), sine	T_{VJ} = 150°C			495	A^2s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			480	A^2s
C_J	*junction capacitance*	V_R = 400 V; f = 1 MHz	T_{VJ} = 25°C		11		pF

Package FO-A

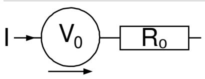
Symbol	Definition	Conditions		min.	typ.	max.	Unit
I_{RMS}	*RMS current*	per terminal				100	A
T_{VJ}	*virtual junction temperature*			-40		150	°C
T_{op}	*operation temperature*			-40		125	°C
T_{stg}	*storage temperature*			-40		125	°C
Weight					15		g
M_D	*mounting torque*			1.5		2	Nm
$d_{Spp/App}$	*creepage distance on surface | striking distance through air*	*terminal to terminal*	13.0	9.5			mm
$d_{Spb/Apb}$		*terminal to backside*					mm
V_{ISOL}	*isolation voltage*	t = 1 second	50/60 Hz, RMS; $I_{ISOL} \leq 1$ mA	3000			V
		t = 1 minute		2500			V



Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	VBO25-12NO2	VBO25-12NO2	Box	10	424412

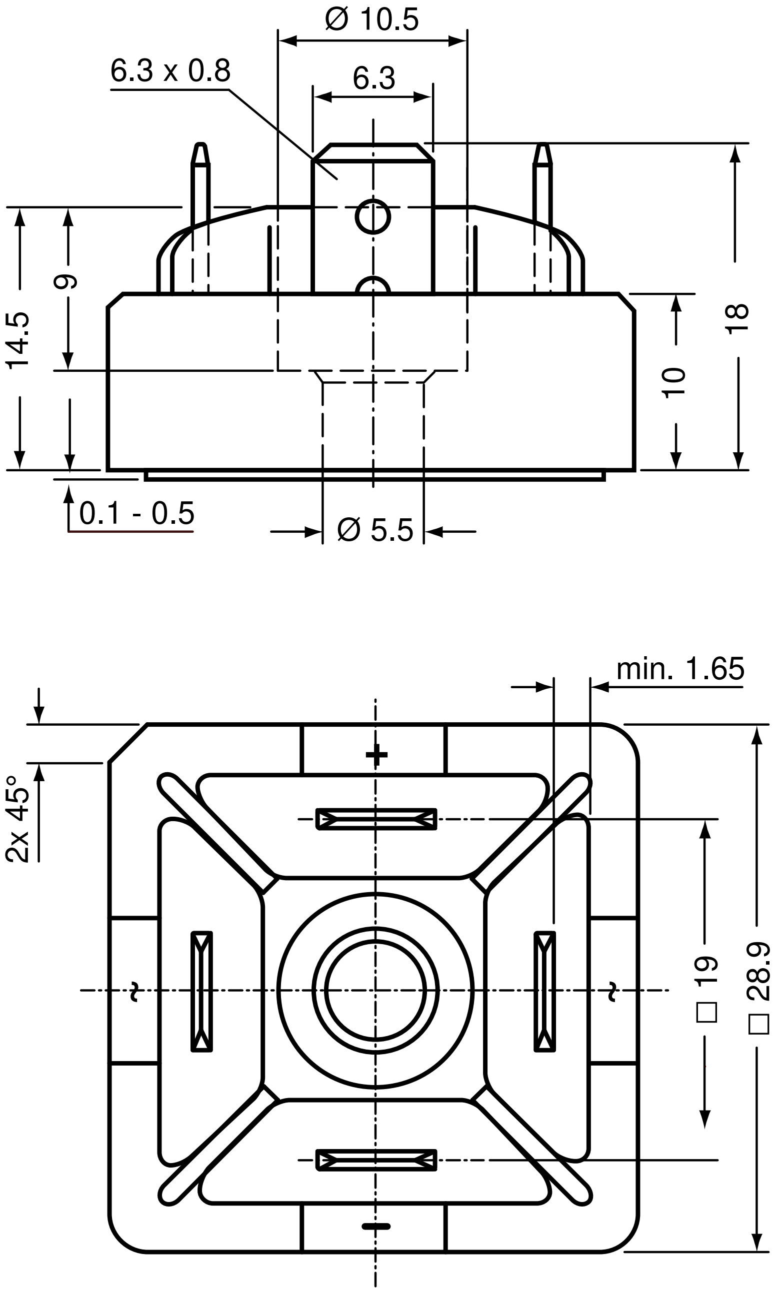
Equivalent Circuits for Simulation

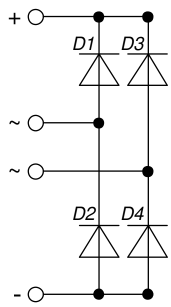
** on die level* $T_{VJ} = 150$°C



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

Outlines FO-A





Rectifier

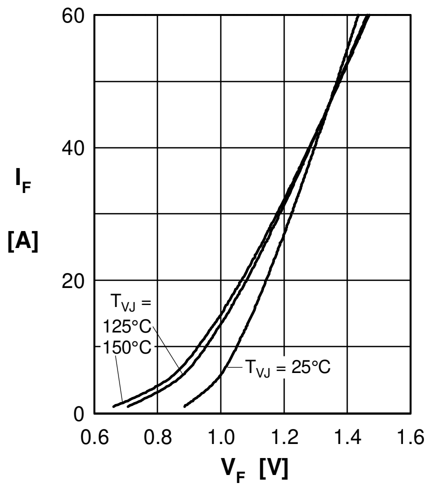


Fig. 1 Forward current vs. voltage drop per diode

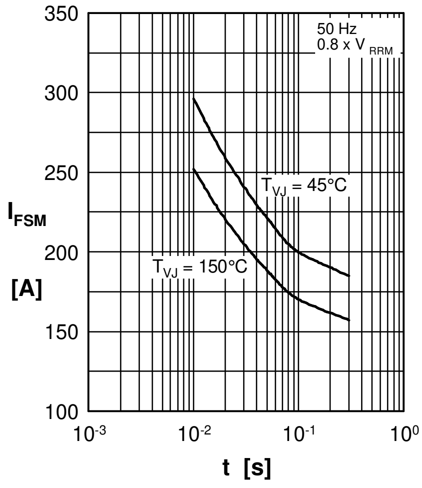


Fig. 2 Surge overload current vs. time per diode

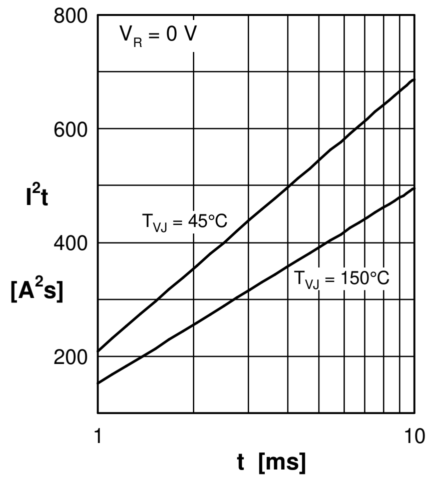


Fig. 3 I^2t vs. time per diode

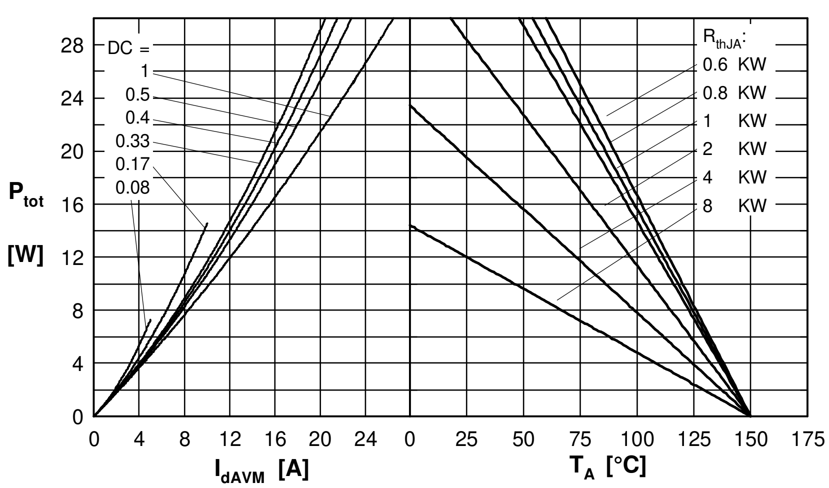


Fig. 4 Power dissipation vs. forward current and ambient temperature per diode

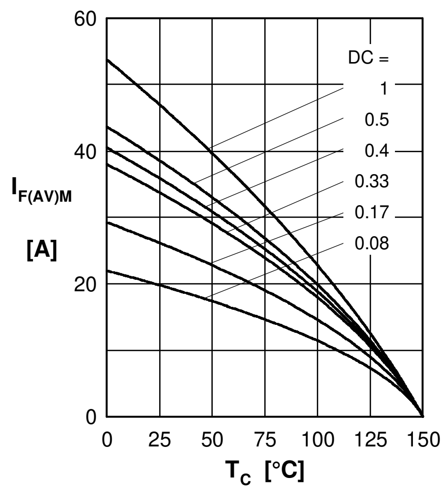


Fig. 5 Max. forward current vs. case temperature per diode

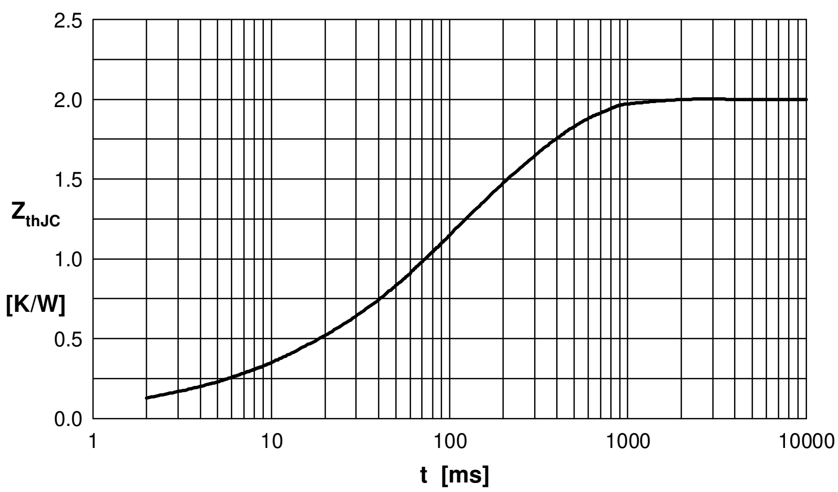


Fig. 6 Transient thermal impedance junction to case vs. time per diode

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