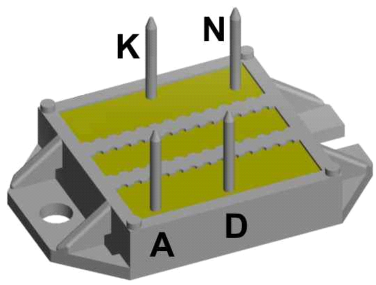
Standard Rectifier Module

1~ Rectifier		
V_{RRM}	=	1600
I_{DAV}	=	55
I_{FSM}	=	300

1~ Rectifier Bridge

Part number

VBO54-16NO7



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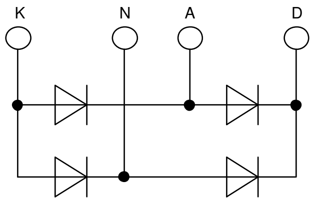


Features / Advantages:

- 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: ECO-PAC1

- Isolation Voltage: 3000 V~
- Industry standard outline
- RoHS compliant
- Soldering pins for PCB mounting
- Height: 9 mm
- Base plate: DCB ceramic
- Reduced weight
- Advanced power cycling

Terms _Conditions of usage:

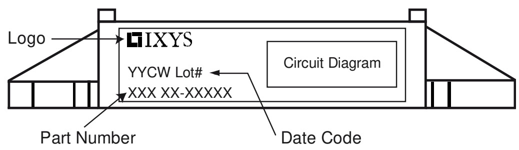
The data contained in this product data sheet is exclusively intended for technically trained staff. The user will have to evaluate the suitability of the product for the intended application and the completeness of the product data with respect to his application. The specifications of our components may not be considered as an assurance of component characteristics. The information in the valid application- and assembly notes must be considered. Should you require product information in excess of the data given in this product data sheet or which concerns the specific application of your product, please contact your local sales office.
Due to technical requirements our product may contain dangerous substances. For information on the types in question please contact your local sales office.
Should you intend to use the product in aviation, in health or life endangering or life support applications, please notify. For any such application we urgently recommend
- to perform joint risk and quality assessments;
- the conclusion of quality agreements;
- to establish joint measures of an ongoing product survey, and that we may make delivery dependent on the realization of any such measures.

IXYS reserves the right to change limits, conditions and dimensions. Data according to IEC 60747and per semiconductor unless otherwise specified 20160615b

Rectifier

Symbol	Definition	Conditions		Ratings min.	typ.	max.	Unit
V_{RSM}	*max. non-repetitive reverse blocking voltage*		T_{VJ} = 25°C			1700	V
V_{RRM}	*max. repetitive reverse blocking voltage*		T_{VJ} = 25°C			1600	V
I_R	*reverse current*	V_R = 1600 V	T_{VJ} = 25°C			40	µA
		V_R = 1600 V	T_{VJ} = 150°C			1.5	mA
V_F	*forward voltage drop*	I_F = 20 A	T_{VJ} = 25°C			1.15	V
		I_F = 40 A				1.34	V
		I_F = 20 A	T_{VJ} = 125°C			1.12	V
		I_F = 40 A				1.32	V
I_{DAV}	*bridge output current*	T_C = 105°C rectangular d = 0.5	T_{VJ} = 150°C			55	A
V_{F0}	*threshold voltage*	*for power loss calculation only*	T_{VJ} = 150°C			0.82	V
r_F	*slope resistance*	*for power loss calculation only*				12.2	mΩ
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°C			110	W
I_{FSM}	*max. forward surge current*	t = 10 ms; (50 Hz), sine	T_{VJ} = 45°C			300	A
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			325	A
		t = 10 ms; (50 Hz), sine	T_{VJ} = 150°C			255	A
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			275	A
I^2t	*value for fusing*	t = 10 ms; (50 Hz), sine	T_{VJ} = 45°C			450	A²s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			440	A²s
		t = 10 ms; (50 Hz), sine	T_{VJ} = 150°C			325	A²s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			315	A²s
C_J	*junction capacitance*	V_R = 400 V; f = 1 MHz	T_{VJ} = 25°C		10		pF

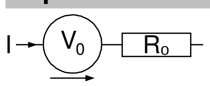
Package ECO-PAC1				Ratings			
Symbol	**Definition**	**Conditions**		**min.**	**typ.**	**max.**	**Unit**
I_{RMS}	*RMS current*	per terminal				100	A
T_{VJ}	*virtual junction temperature*			-40		150	°C
T_{op}	*operation temperature*			-40		125	°C
T_{stg}	*storage temperature*			-40		125	°C
Weight					19		g
M_D	*mounting torque*			1.4		2	Nm
$d_{Spp/App}$	*creepage distance on surface | striking distance through air*		*terminal to terminal*	6.0			mm
$d_{Spb/Apb}$			*terminal to backside*	10.0			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	VBO54-16NO7	VBO54-16NO7	Box	25	479551

Equivalent Circuits for Simulation

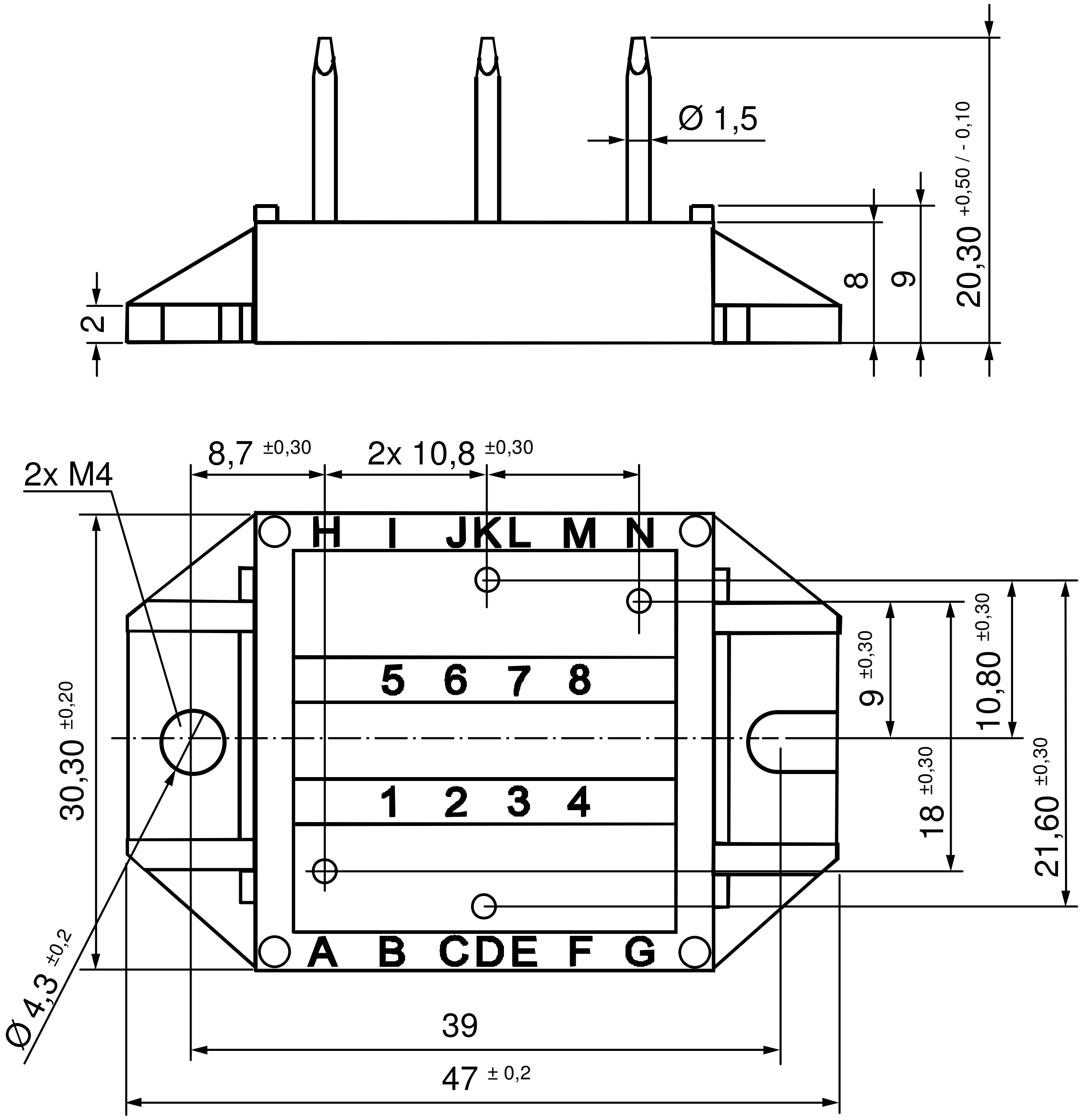
** on die level* T_{VJ} = 150 °C

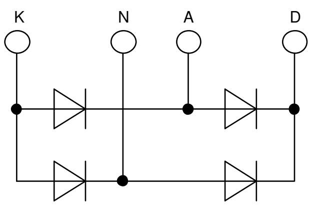


Rectifier

$V_{0\ max}$	*threshold voltage*	0.82	V
$R_{0\ max}$	*slope resistance **	11	mΩ

Outlines ECO-PAC1





Rectifier

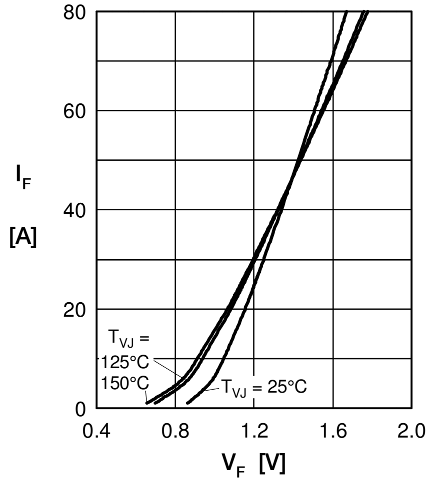


Fig. 1 Forward current versus voltage drop per diode

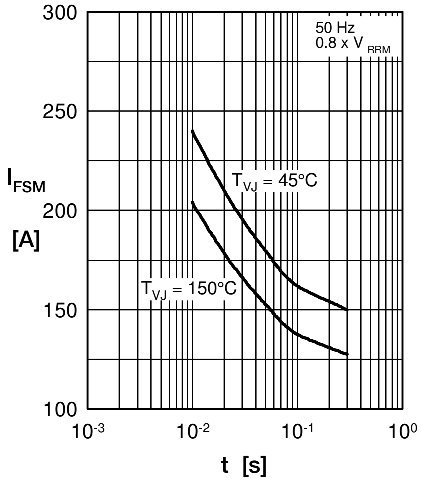


Fig. 2 Surge overload current

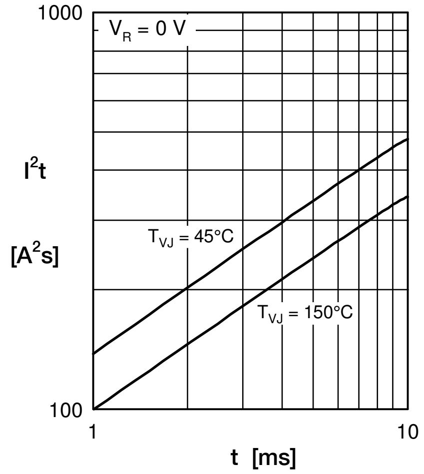


Fig. 3 I^2t versus time per diode

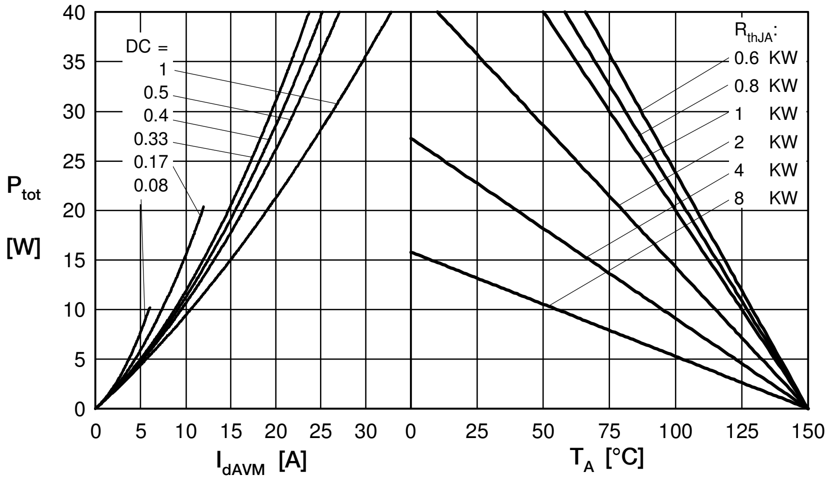


Fig. 4 Power dissipation vs. direct output current & ambient temperature

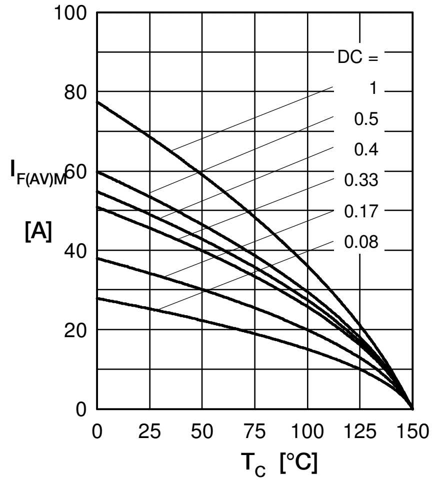


Fig. 5 Max. forward current vs. case temperature

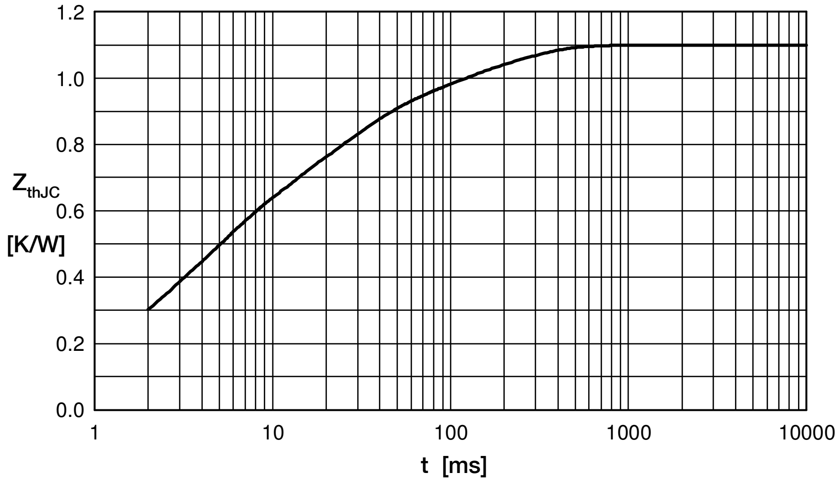


Fig. 6 Transient thermal impedance junction to case

Constants for Z_{thJC} calculation:

i	R_{th} (K/W)	t_i (s)
1	0.05070	0.004
2	0.163	0.0025
3	0.2805	0.0035
4	0.363	0.02
5	0.2228	0.15