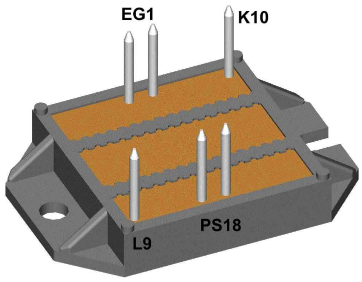
Standard Rectifier Module

1~ Rectifier		
V_{RRM}	=	1600 V
I_{DAV}	=	80 A
I_{FSM}	=	750 A

1~ Rectifier Bridge

Part number

VBO78-16NO7



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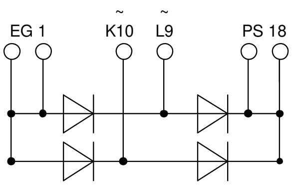

Features / Advantages:

- 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-PAC2

- 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

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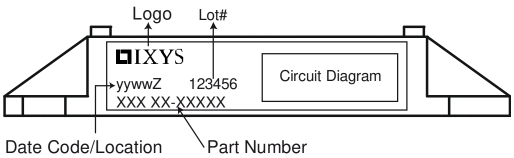
Rectifier					Ratings		
Symbol	Definition	Conditions		min.	typ.	max.	Unit
V_{RSM}	*max. non-repetitive reverse blocking voltage*		T_{VJ} = 25°C			1700	V
V_{RRM}	*max. repetitive reverse blocking voltage*		T_{VJ} = 25°C			1600	V
I_R	*reverse current*	V_R = 1600 V	T_{VJ} = 25°C			100	µA
		V_R = 1600 V	T_{VJ} = 150°C			1.5	mA
V_F	*forward voltage drop*	I_F = 40 A	T_{VJ} = 25°C			1.14	V
		I_F = 80 A				1.32	V
		I_F = 40 A	T_{VJ} = 125°C			1.06	V
		I_F = 80 A				1.29	V
I_{DAV}	*bridge output current*	T_C = 115°C rectangular d = 0.5	T_{VJ} = 150°C			80	A
V_{F0}	*threshold voltage*	*for power loss calculation only*	T_{VJ} = 150°C			0.81	V
r_F	*slope resistance*					5.9	mΩ
R_{thJC}	*thermal resistance junction to case*					0.7	K/W
R_{thCH}	*thermal resistance case to heatsink*				0.3		K/W
P_{tot}	*total power dissipation*		T_C = 25°C			175	W
I_{FSM}	*max. forward surge current*	t = 10 ms; (50 Hz), sine	T_{VJ} = 45°C			750	A
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			810	A
		t = 10 ms; (50 Hz), sine	T_{VJ} = 150°C			640	A
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			690	A
I^2t	*value for fusing*	t = 10 ms; (50 Hz), sine	T_{VJ} = 45°C			2.82	kA²s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			2.73	kA²s
		t = 10 ms; (50 Hz), sine	T_{VJ} = 150°C			2.05	kA²s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			1.98	kA²s
C_J	*junction capacitance*	V_R = 400 V; f = 1 MHz	T_{VJ} = 25°C		11		pF

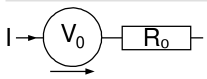
Package ECO-PAC2				Ratings			
Symbol	**Definition**	**Conditions**		**min.**	**typ.**	**max.**	**Unit**
I_{RMS}	*RMS current*	per terminal				100	A
T_{VJ}	*virtual junction temperature*			-40		150	°C
T_{op}	*operation temperature*			-40		125	°C
T_{stg}	*storage temperature*			-40		125	°C
Weight					24		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	VBO78-16NO7	VBO78-16NO7	Box	25	494356

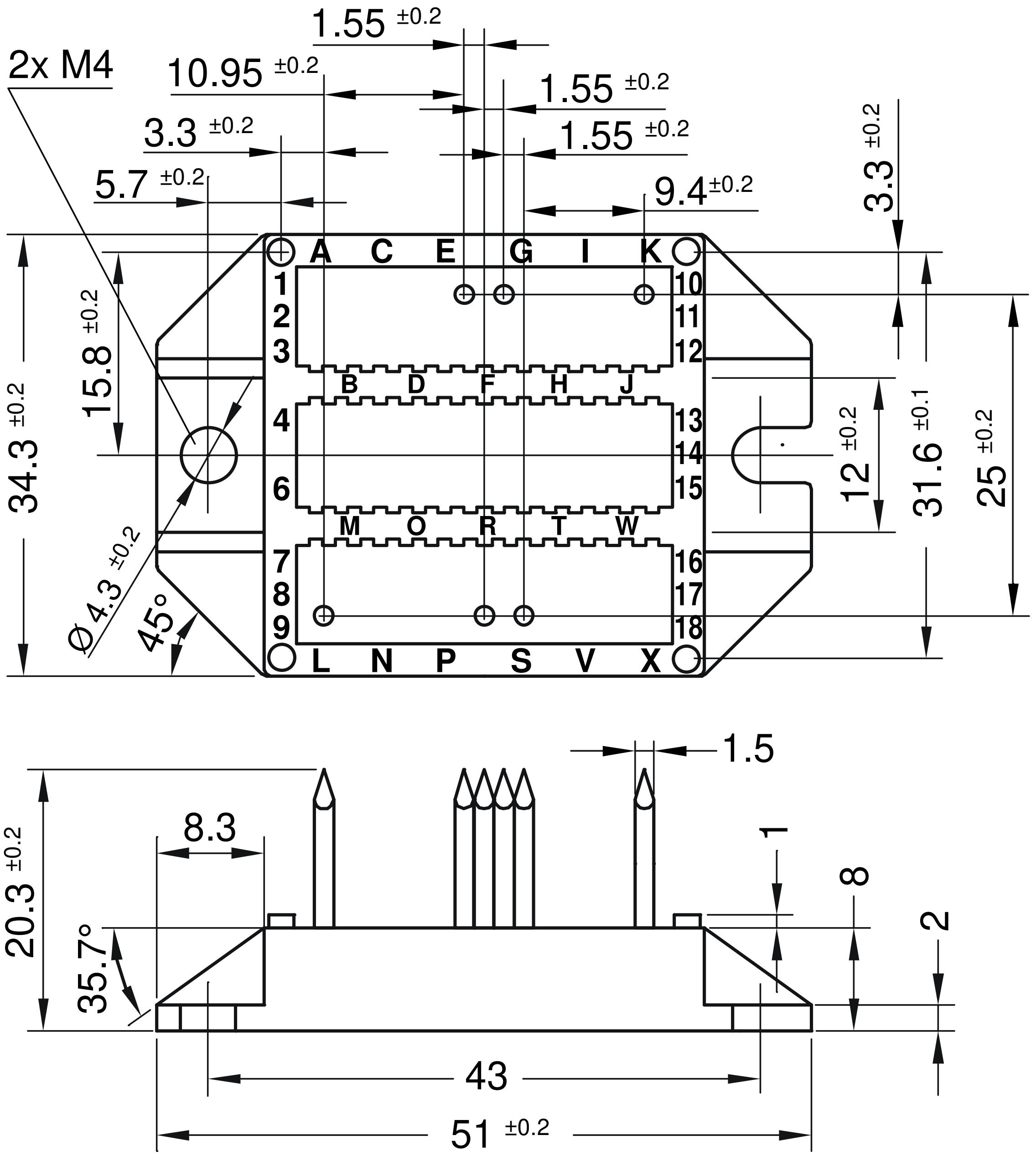
Equivalent Circuits for Simulation

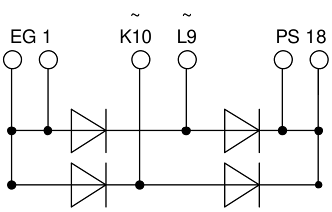
** on die level* $T_{VJ} = 150°C$



		Rectifier	
$V_{0\,max}$	*threshold voltage*	0.81	V
$R_{0\,max}$	*slope resistance **	4.6	mΩ

Outlines ECO-PAC2





Rectifier

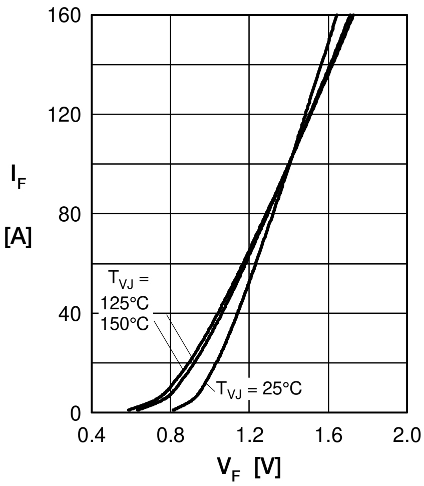


Fig. 1 Forward current versus voltage drop per diode

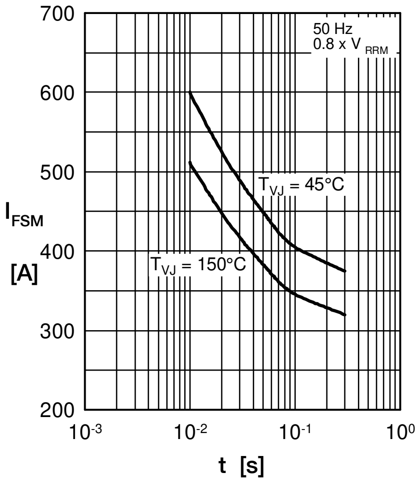


Fig. 2 Surge overload current

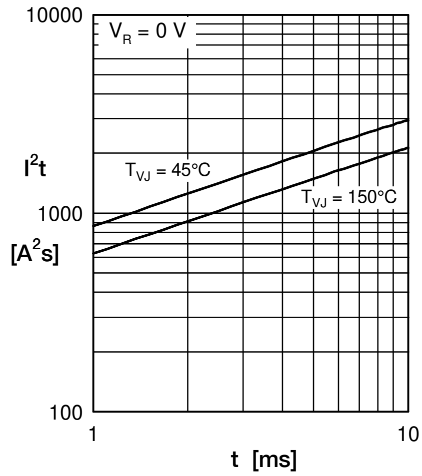


Fig. 3 I^2t versus time per diode

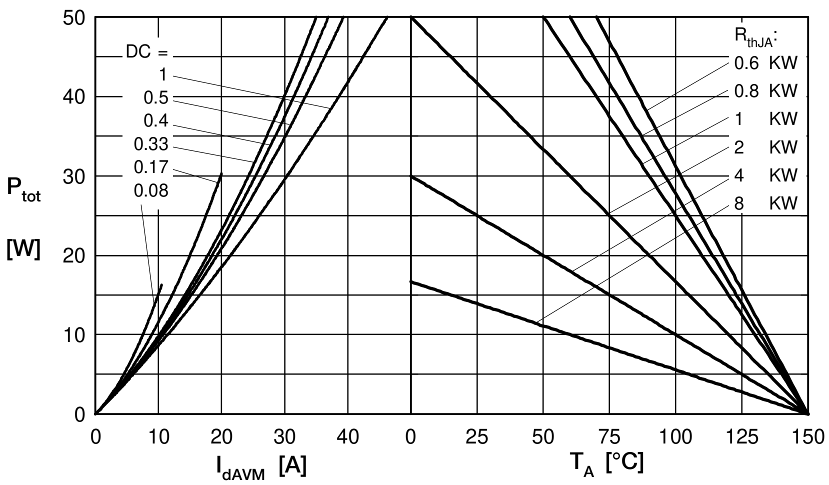


Fig. 4 Power dissipation vs. direct output current & ambient temperature

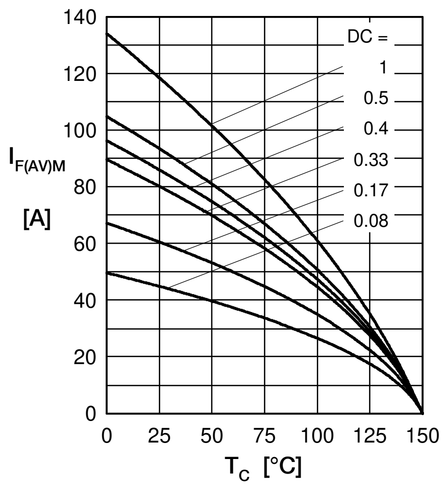


Fig. 5 Max. forward current vs. case temperature

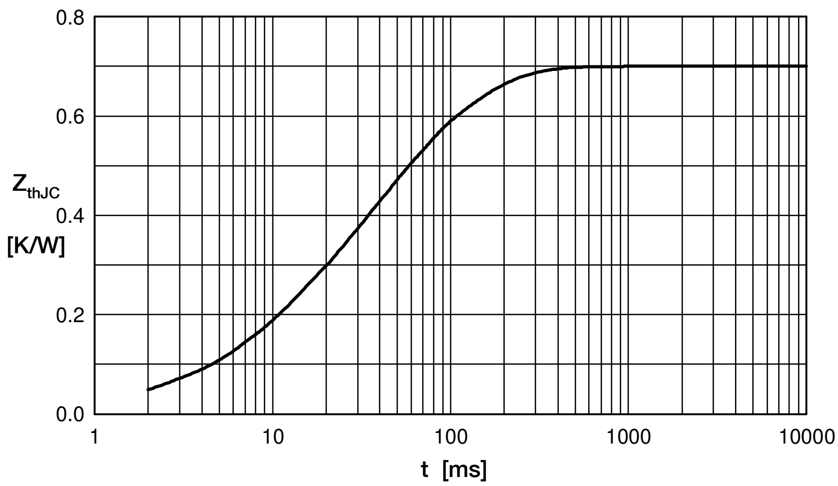


Fig. 6 Transient thermal impedance junction to case

Constants for Z_{thJC} calculation:

i	R_{th} (K/W)	t_i (s)
1	0.09	0.012
2	0.05	0.007
3	0.32	0.036
4	0.24	0.102