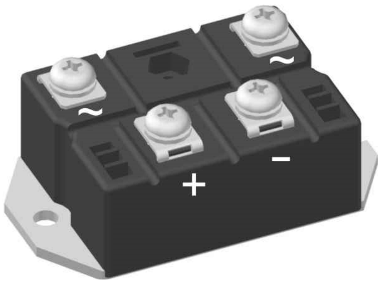
Standard Rectifier Module

1~ Rectifier		
V_{RRM}	=	1200 V
I_{DAV}	=	160 A
I_{FSM}	=	2800 A

1~ Rectifier Bridge

Part number

VBO160-12NO7



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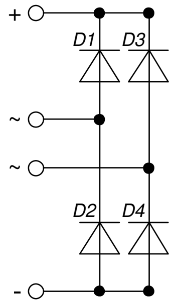

Features / Advantages:

- 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: PWS-E

- Isolation Voltage: 3000 V~
- Industry standard outline
- RoHS compliant
- Easy to mount with two screws
- Base plate: Copper internally DCB isolated
- Advanced power cycling

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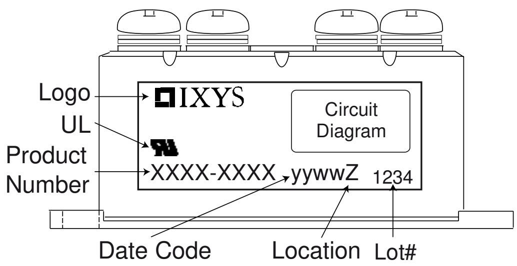
Rectifier

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			200	µA
		V_R = 1200 V	T_{VJ} = 150°C			3.5	mA
V_F	*forward voltage drop*	I_F = 160 A	T_{VJ} = 25°C			1.07	V
		I_F = 320 A				1.22	V
		I_F = 160 A	T_{VJ} = 125°C			0.96	V
		I_F = 320 A				1.15	V
I_{DAV}	*bridge output current*	T_C = 110°C	T_{VJ} = 150°C			160	A
		rectangular d = 0.5					
V_{F0}	*threshold voltage*	*for power loss calculation only*	T_{VJ} = 150°C			0.74	V
r_F	*slope resistance*					2.4	mΩ
R_{thJC}	*thermal resistance junction to case*					0.4	K/W
R_{thCH}	*thermal resistance case to heatsink*				0.15		K/W
P_{tot}	*total power dissipation*		T_C = 25°C			310	W
I_{FSM}	*max. forward surge current*	t = 10 ms; (50 Hz), sine	T_{VJ} = 45°C			2.80	kA
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			3.03	kA
		t = 10 ms; (50 Hz), sine	T_{VJ} = 150°C			2.38	kA
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			2.57	kA
I^2t	*value for fusing*	t = 10 ms; (50 Hz), sine	T_{VJ} = 45°C			39.2	kA²s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			38.1	kA²s
		t = 10 ms; (50 Hz), sine	T_{VJ} = 150°C			28.3	kA²s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			27.5	kA²s
C_J	*junction capacitance*	V_R = 400 V; f = 1 MHz	T_{VJ} = 25°C		133		pF

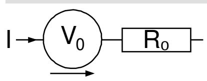
Package PWS-E				Ratings			
Symbol	**Definition**	**Conditions**		**min.**	**typ.**	**max.**	**Unit**
I_{RMS}	*RMS current*	per terminal				250	A
T_{VJ}	*virtual junction temperature*			-40		150	°C
T_{op}	*operation temperature*			-40		125	°C
T_{stg}	*storage temperature*			-40		125	°C
Weight					273		g
M_D	*mounting torque*			4.25		5.75	Nm
M_T	*terminal torque*			4.25		5.75	Nm
$d_{Spp/App}$	*creepage distance on surface | striking distance through air*		*terminal to terminal*	12.0			mm
$d_{Spb/Apb}$			*terminal to backside*	26.0			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	VBO160-12NO7	VBO160-12NO7	Box	5	474029

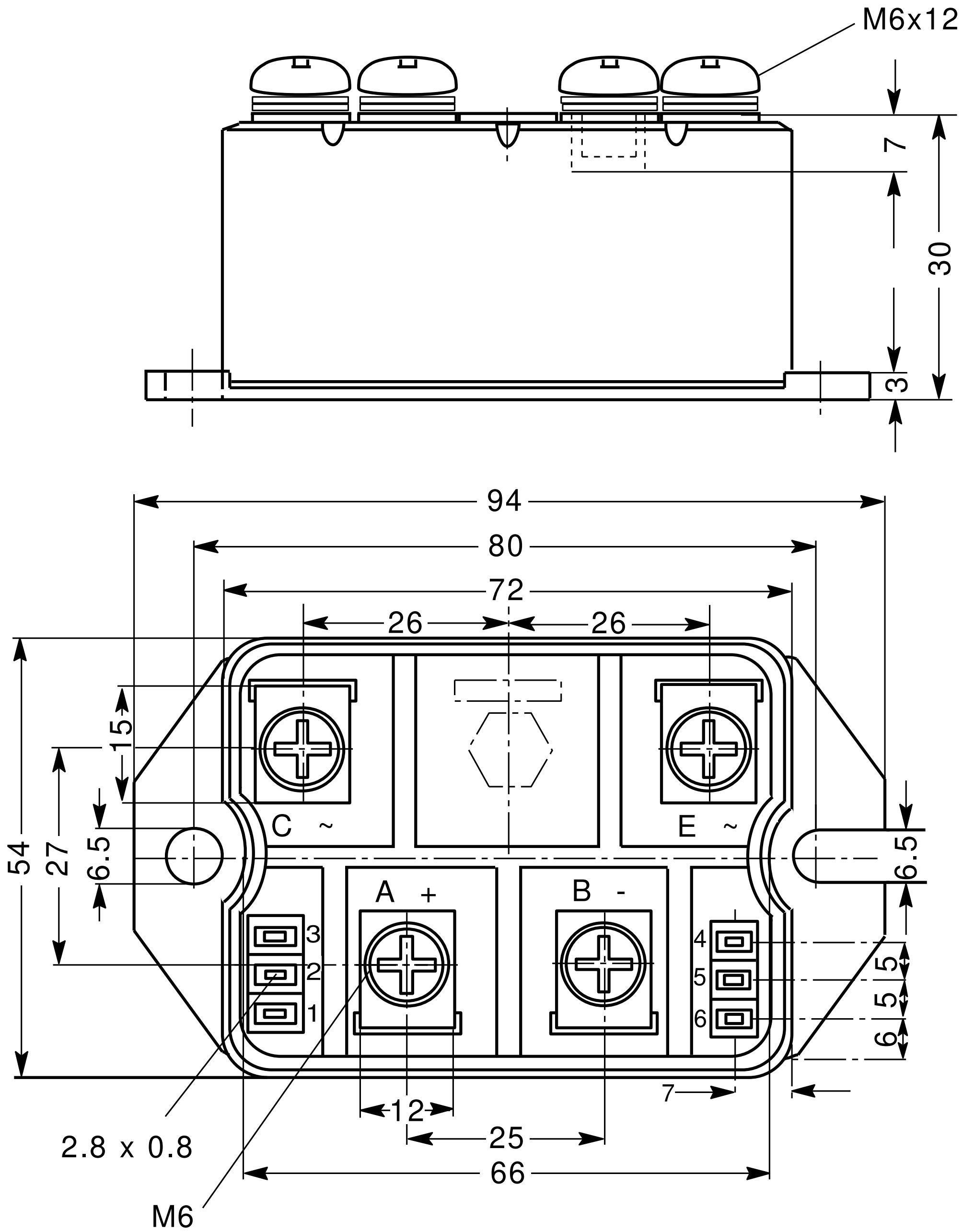
Equivalent Circuits for Simulation

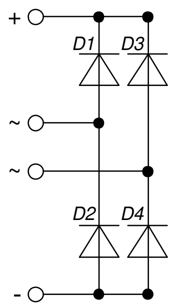
** on die level* $T_{VJ} = 150°C$



		Rectifier	
$V_{0\ max}$	*threshold voltage*	0.74	V
$R_{0\ max}$	*slope resistance **	1.2	mΩ

Outlines PWS-E





Rectifier

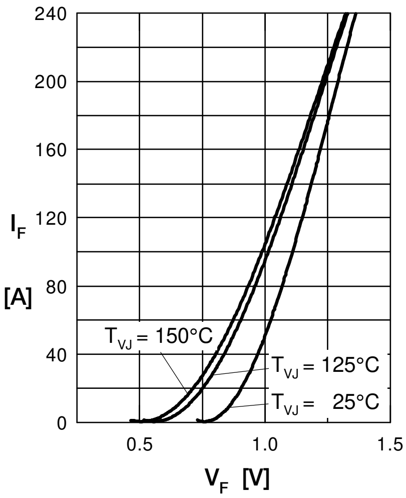


Fig. 1 Forward current vs. voltage drop per diode

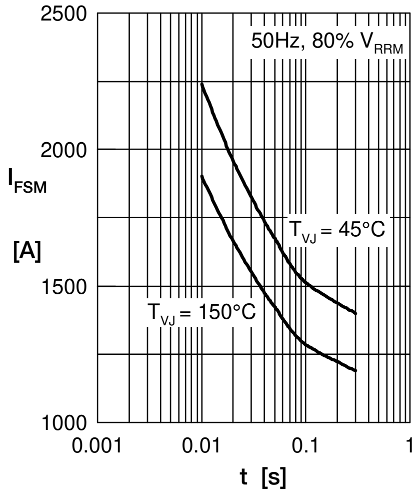


Fig. 2 Surge overload current vs. time per diode

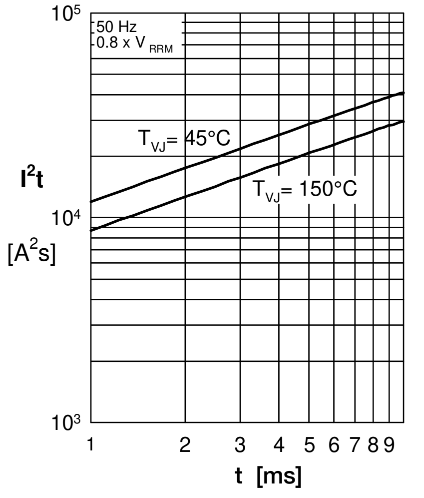


Fig. 3 I^2t vs. time per diode

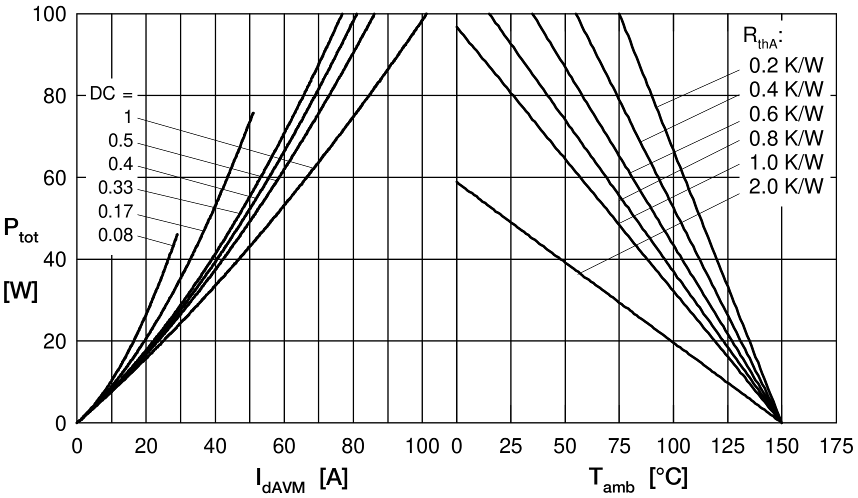


Fig. 4 Power dissipation vs. forward current and ambient temperature per diode

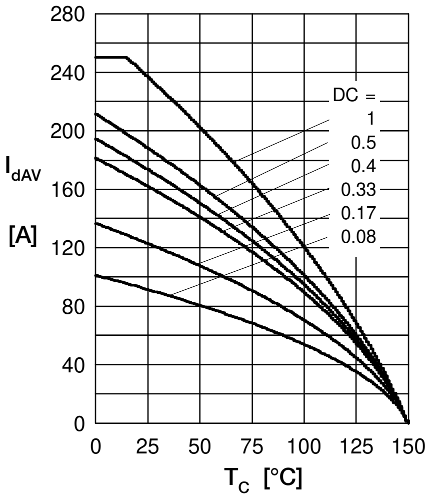
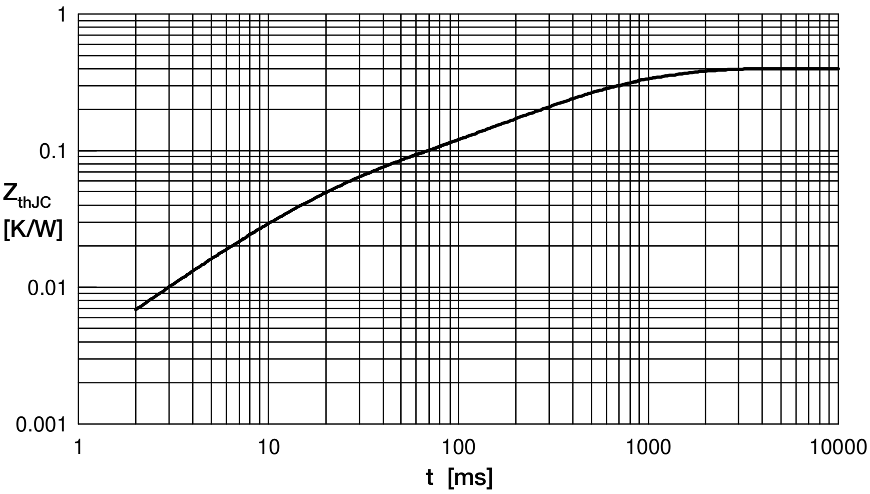


Fig. 5 Max. forward current vs. case temperature per diode



R_i	t_i
0.050	0.02
0.003	0.01
0.100	0.225
0.177	0.8
0.070	0.58

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