Standard Rectifier Module

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

1~ Rectifier Bridge

Part number

VBO160-12NO7
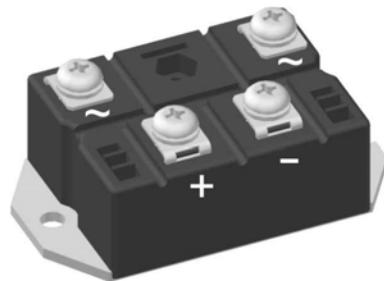
U E72873
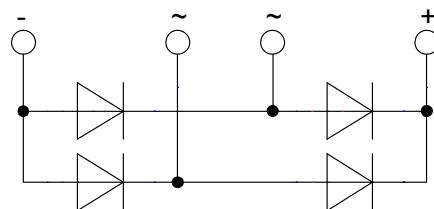
Features / Advantages:
● Package with DCB ceramic
● Improved temperature and power cycling
● Planar passivated chips
● Very low forward voltage drop
● Very low leakage current

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
● Industry standard outline
● RoHS compliant
● Easy to mount with two screws
● Base plate: Copper internally DCB isolated
● Advanced power cycling

Rectifier

Symbol	Definition	Conditions		min.	typ.	max.	Unit
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

Data according to IEC 60747and per semiconductor unless otherwise specified   20130425a

Package	PWS-E		Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit
I_{RMS}	RMS current	per terminal			250	A
T_{stg}	storage temperature		-40		125	°C
T_{VJ}	virtual junction temperature		-40		150	°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	3000			V
		t = 1 minute	50/60 Hz, RMS; $I_{ISOL} \leq 1$ mA	2500			V

Product Number
Made in Germany
Circuit Diagram
XXXX-XXXX   YYCW Lot#
Date Code
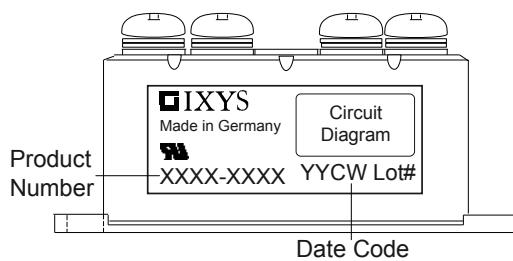
Ordering	Part Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	VBO160-12NO7	VBO160-12NO7	Box	5	474029

Equivalent Circuits for Simulation   *on die level* T_{VJ} = 150 °C

I — V_0 — R_0
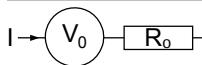
Rectifier

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

Outlines   PWS-E

M6x12

94
80
72
26
26

15
6.5
54
27

C ~

E ~

6.5

A +
B -

3
2
1

4
5
6

5
6

2.8 x 0.8

M6

12
25
66

7
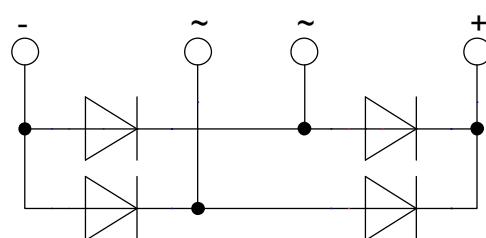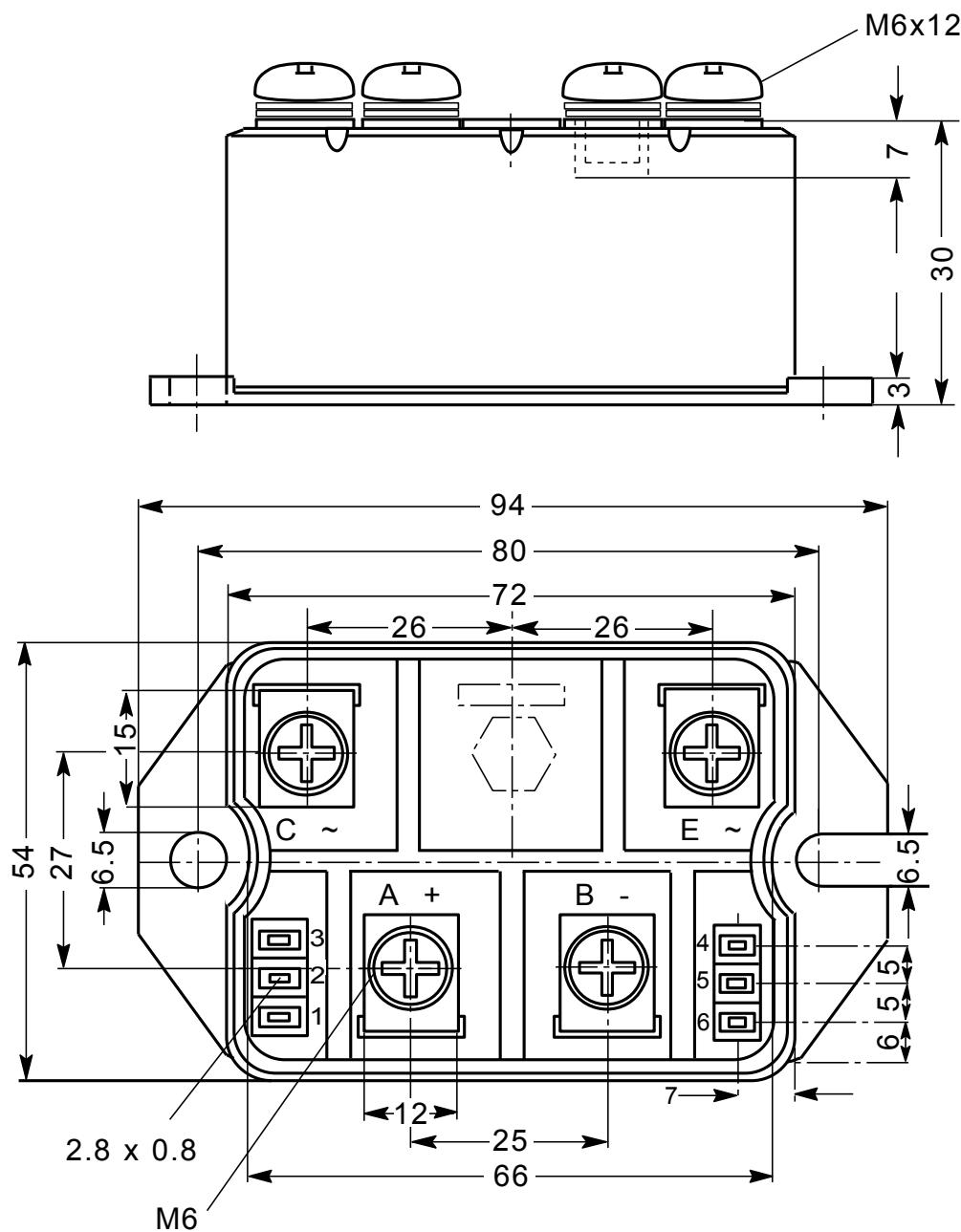
Rectifier
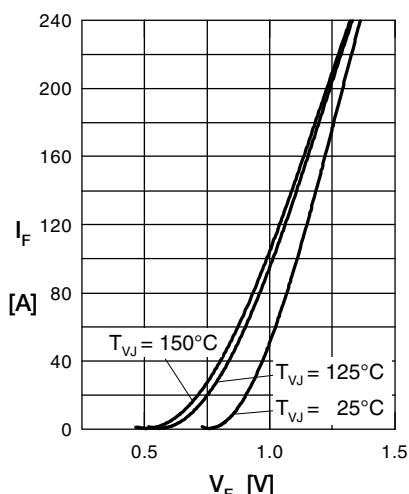
Fig. 1 Forward current vs.
voltage drop per diode
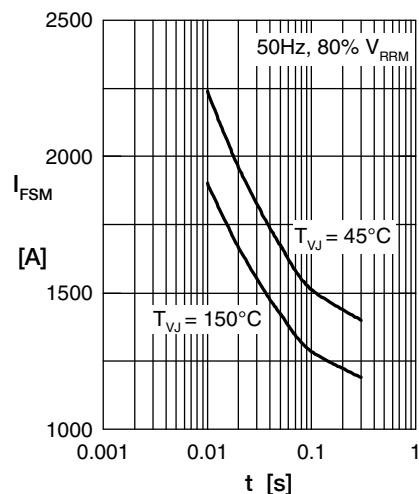
Fig. 2 Surge overload current
vs. time per diode
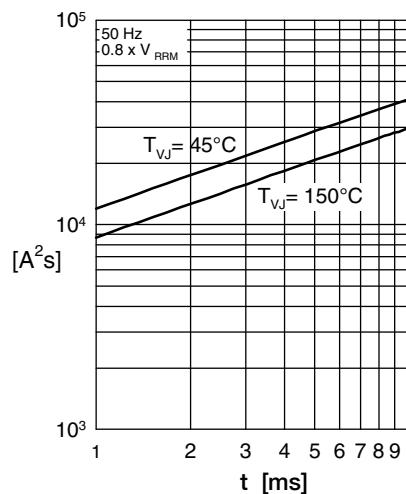
Fig. 3 I^2t vs. time per diode
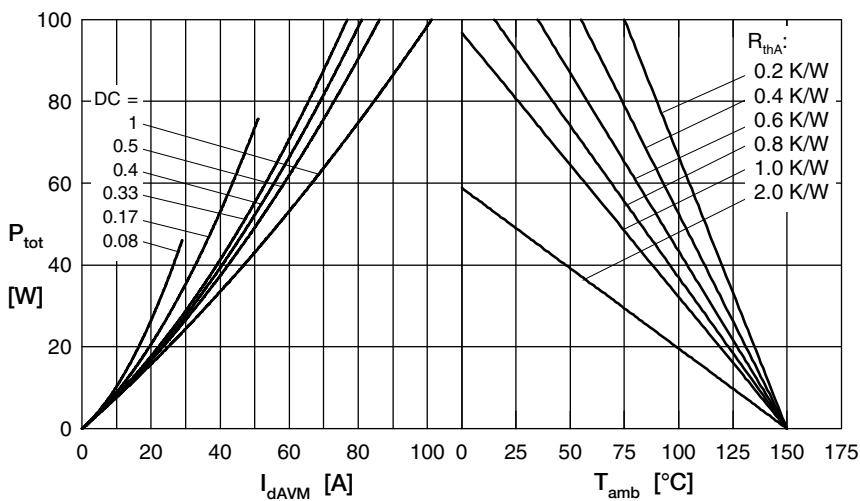
Fig. 4 Power dissipation vs. forward current
and ambient temperature per diode
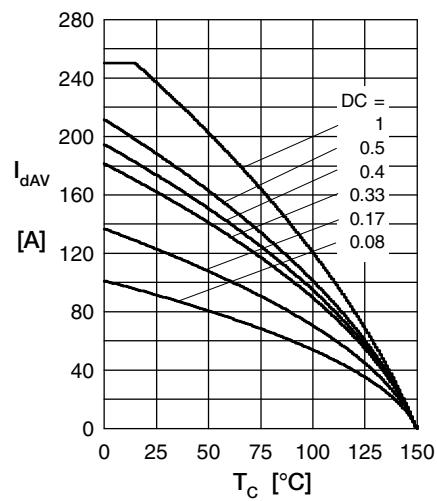
Fig. 5 Max. forward current vs.
case temperature per diode

Fig. 6 Transient thermal impedance junction to case vs. time per diode
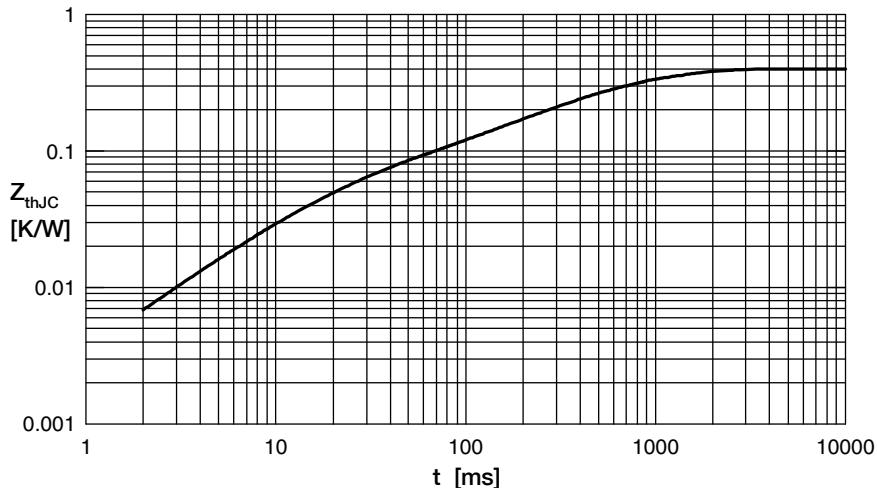
R_i	t_i
0.050	0.02
0.003	0.01
0.100	0.225
0.177	0.8
0.070	0.58

IXYS reserves the right to change limits, conditions and dimensions.   Data according to IEC 60747and per semiconductor unless otherwise specified   20130425a