

## Standard Rectifier

1~ Rectifier	
$V_{RRM}$	= 1200 V
$I_{DAV}$	= 40 A
$I_{FSM}$	= 320 A

### 1~ Rectifier Bridge

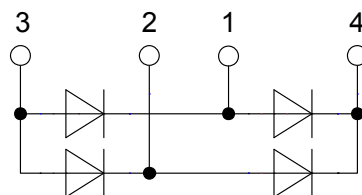
Part number

VBO40-12NO6



Backside: isolated

 E72873



#### 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

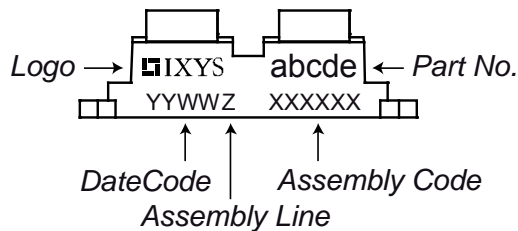
#### Package: SOT-227B (minibloc)

- Isolation Voltage: 3000 V~
- Industry standard outline
- RoHS compliant
- Epoxy meets UL 94V-0
- Base plate: Copper internally DCB isolated
- Advanced power cycling

Rectifier				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
$V_{RSM}$	max. non-repetitive reverse blocking voltage					1300	V
$V_{RRM}$	max. repetitive reverse blocking voltage					1200	V
$I_R$	reverse current	$V_R = 1200$ V	$T_{VJ} = 25^\circ\text{C}$			40	$\mu\text{A}$
		$V_R = 1200$ V	$T_{VJ} = 150^\circ\text{C}$			1.5	mA
$V_F$	forward voltage drop	$I_F = 20$ A	$T_{VJ} = 25^\circ\text{C}$			1.15	V
						1.33	V
		$I_F = 40$ A	$T_{VJ} = 125^\circ\text{C}$			1.07	V
						1.31	V
$I_{DAV}$	bridge output current	$T_C = 115^\circ\text{C}$ rectangular	$T_{VJ} = 150^\circ\text{C}$			40	A
$V_{FO}$	threshold voltage					0.81	V
$r_F$	slope resistance					12.1	m $\Omega$
		} for power loss calculation only					
$R_{thJC}$	thermal resistance junction to case					1.3	K/W
$R_{thCH}$	thermal resistance case to heatsink				0.10		K/W
$P_{tot}$	total power dissipation			$T_C = 25^\circ\text{C}$		95	W
$I_{FSM}$	max. forward surge current	t = 10 ms; (50 Hz), sine	$T_{VJ} = 45^\circ\text{C}$			320	A
						t = 8,3 ms; (60 Hz), sine	$V_R = 0$ V
		t = 10 ms; (50 Hz), sine	$T_{VJ} = 150^\circ\text{C}$			270	A
						t = 8,3 ms; (60 Hz), sine	$V_R = 0$ V
$I^2t$	value for fusing	t = 10 ms; (50 Hz), sine	$T_{VJ} = 45^\circ\text{C}$			510	A <sup>2</sup> s
						t = 8,3 ms; (60 Hz), sine	$V_R = 0$ V
		t = 10 ms; (50 Hz), sine	$T_{VJ} = 150^\circ\text{C}$			365	A <sup>2</sup> s
						t = 8,3 ms; (60 Hz), sine	$V_R = 0$ V
$C_J$	junction capacitance	$V_R = 400$ V; f = 1 MHz		$T_{VJ} = 25^\circ\text{C}$		11	pF

Package SOT-227B (minibloc)				Ratings		
Symbol	Definition	Conditions	min.	typ.	max.	Unit
$I_{RMS}$	RMS current	per terminal			150	A
$T_{stg}$	storage temperature		-40		150	°C
$T_{VJ}$	virtual junction temperature		-40		150	°C
<b>Weight</b>				30		g
$M_D$	mounting torque		1.1		1.5	Nm
$M_T$	terminal torque		1.1		1.5	Nm
$d_{Spp/App}$	creepage distance on surface   striking distance through air	terminal to terminal	10.5	3.2		mm
$d_{Spt/Abp}$		terminal to backside	8.6	6.8		mm
$V_{ISOL}$	isolation voltage	t = 1 second	50/60 Hz, RMS; $I_{ISOL} \leq 1$ mA	3000		V
		t = 1 minute		2500		V

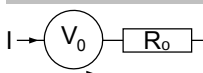
### Product Marking



Ordering	Part Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	VBO40-12NO6	VBO40-12NO6	Tube	10	475890

Similar Part	Package	Voltage class
VBO40-16NO6	SOT-227B (minibloc)	1600
VBO40-08NO6	SOT-227B (minibloc)	800

### Equivalent Circuits for Simulation

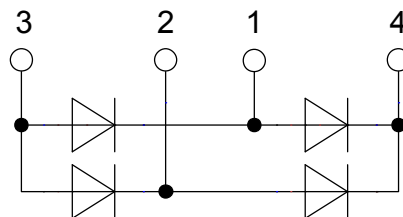
*\* on die level*
 $T_{VJ} = 150\text{ °C}$ 

**Rectifier**

$V_{0\ max}$	threshold voltage	0.81	V
$R_{0\ max}$	slope resistance *	10.2	mΩ

## Outlines SOT-227B (minibloc)



Dim.	Millimeter		Inches	
	min	max	min	max
A	31.50	31.88	1.240	1.255
B	7.80	8.20	0.307	0.323
C	4.09	4.29	0.161	0.169
D	4.09	4.29	0.161	0.169
E	4.09	4.29	0.161	0.169
F	14.91	15.11	0.587	0.595
G	30.12	30.30	1.186	1.193
H	37.80	38.23	1.488	1.505
J	11.68	12.22	0.460	0.481
K	8.92	9.60	0.351	0.378
L	0.74	0.84	0.029	0.033
M	12.50	13.10	0.492	0.516
N	25.15	25.42	0.990	1.001
O	1.95	2.13	0.077	0.084
P	4.95	6.20	0.195	0.244
Q	26.54	26.90	1.045	1.059
R	3.94	4.42	0.155	0.167
S	4.55	4.85	0.179	0.191
T	24.59	25.25	0.968	0.994
U	-0.05	0.10	-0.002	0.004
V	3.20	5.50	0.126	0.217
W	19.81	21.08	0.780	0.830
Z	2.50	2.70	0.098	0.106



## Rectifier

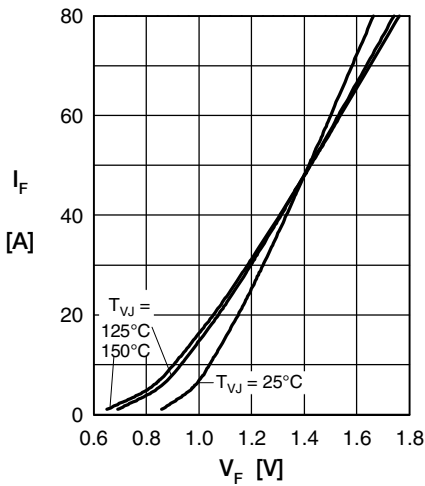


Fig. 1 Forward current vs. voltage drop per diode

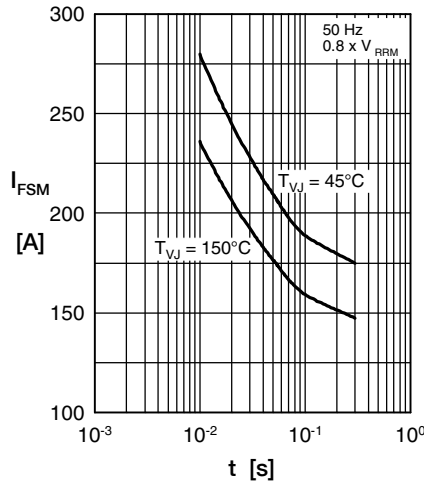


Fig. 2 Surge overload current vs. time per diode

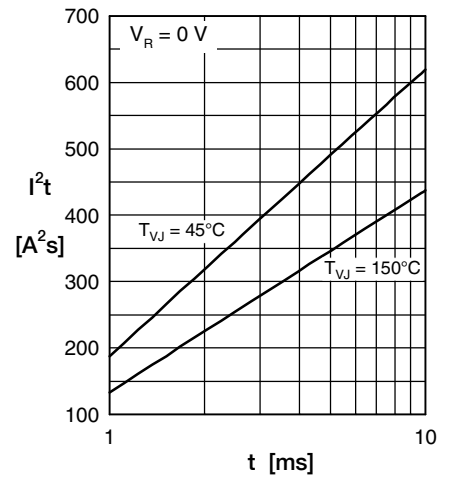


Fig. 3  $I^2t$  vs. time per diode

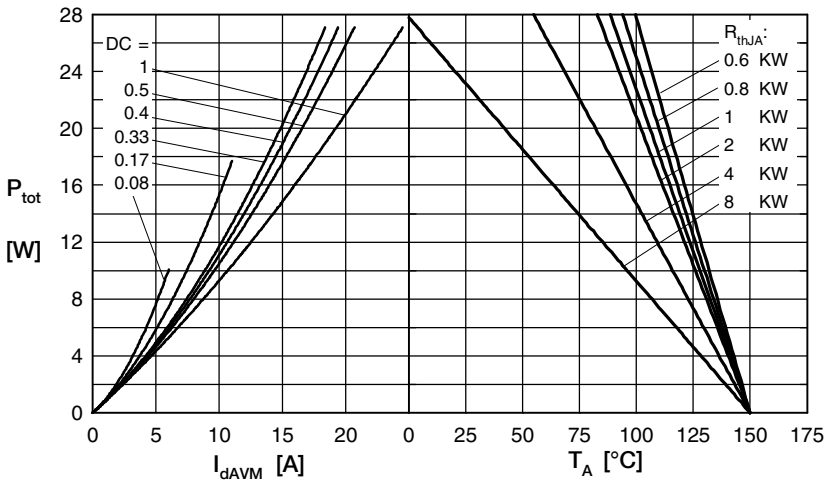


Fig. 4 Power dissipation vs. forward current and ambient temperature per diode

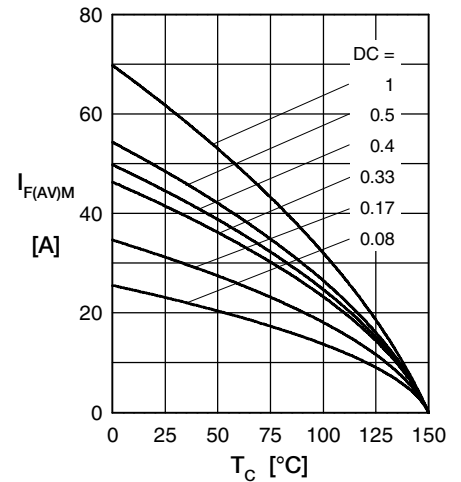


Fig. 5 Max. forward current vs. case temperature per diode

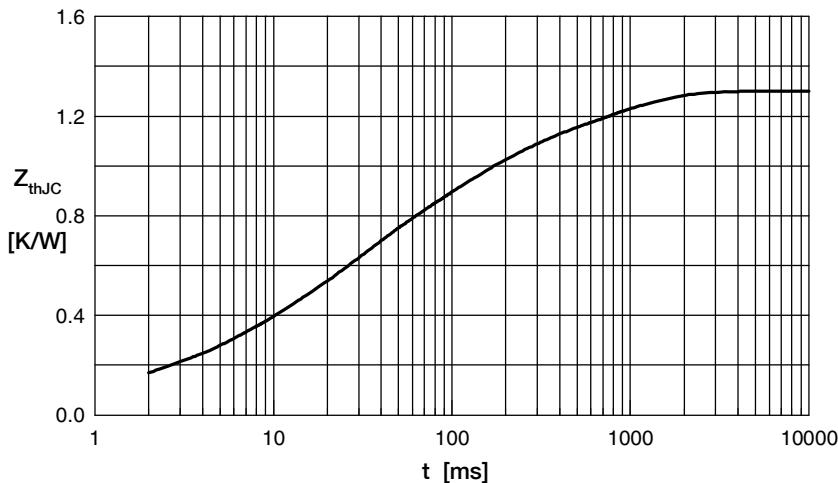


Fig. 6 Transient thermal impedance junction to case vs. time per diode

Constants for  $Z_{thJC}$  calculation:

i	$R_{th}$ (K/W)	$t_i$ (s)
1	0.061	0.0002
2	0.145	0.0036
3	0.398	0.0200
4	0.405	0.1000
5	0.291	0.7000