



# SMBYW04-200 BYW4200B

## HIGH EFFICIENCY FAST RECOVERY DIODE

### MAIN PRODUCT CHARACTERISTICS

<b>I<sub>F(AV)</sub></b>	<b>4 A</b>
<b>V<sub>RRM</sub></b>	<b>200 V</b>
<b>V<sub>F (max)</sub></b>	<b>0.85 V</b>
<b>T<sub>j (max)</sub></b>	<b>150 °C</b>

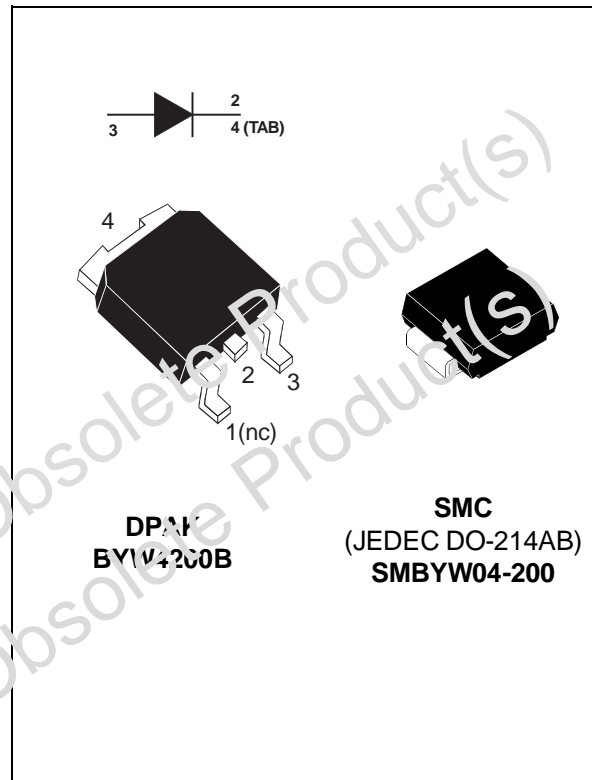
### FEATURES AND BENEFITS

- SUITED TO SMPS AND DRIVES
- SURFACE MOUNT PACKAGE
- VERY LOW FORWARD LOSSES
- NEGLIGIBLE SWITCHING LOSSES
- HIGH SURGE CURRENT CAPABILITY

### DESCRIPTION

Single chip rectifier suited to Switch Mode Power Supplies and high frequency converters.

Packaged in DPAK and SMC, this surface mount device is intended for use in low voltage, high frequency inverters, free wheeling and rectification applications.



### ABSOLUTE RATINGS (limiting values)

Symbol	Parameter		Value	Unit
V <sub>RRM</sub>	Repetitive peak reverse voltage		200	V
I <sub>F(RMS)</sub>	RMS forward current		10	A
I <sub>F(AV)</sub>	Average forward current δ = 0.5	DPAK SMC	T <sub>case</sub> = 130°C T <sub>lead</sub> = 70°C	4 A
I <sub>FSM</sub>	Surge non repetitive forward current		t <sub>p</sub> = 10 ms sinusoidal	70 A
T <sub>stg</sub>	Storage temperature range		- 65 to + 150	°C
T <sub>j</sub>	Maximum operating junction temperature		150	°C

## SMBYW04-200 / BYW4200B

### THERMAL RESISTANCE

Symbol	Parameter	Package	Value	Unit
$R_{th(j-c)}$	Junction to case	DPAK	5	°C/W
$R_{th(j-l)}$	Junction to leads	SMC	20	°C/W

### STATIC ELECTRICAL CHARACTERISTICS

Symbol	Tests Conditions	Tests Conditions	Min.	Typ.	Max.	Unit
$I_R^*$	Reverse leakage current	$T_j = 25^\circ\text{C}$	$V_R = V_{RRM}$		10	$\mu\text{A}$
		$T_j = 100^\circ\text{C}$		0.15	0.5	$\text{mA}$
$V_F^{**}$	Forward voltage drop	$T_j = 25^\circ\text{C}$	$I_F = 12\text{ A}$		1.25	V
		$T_j = 100^\circ\text{C}$	$I_F = 4\text{ A}$	0.8	0.95	

Pulse test : \*  $t_p = 5\text{ ms}$ ,  $\delta < 2\%$   
 \*\*  $t_p = 380\text{ }\mu\text{s}$ ,  $\delta < 2\%$

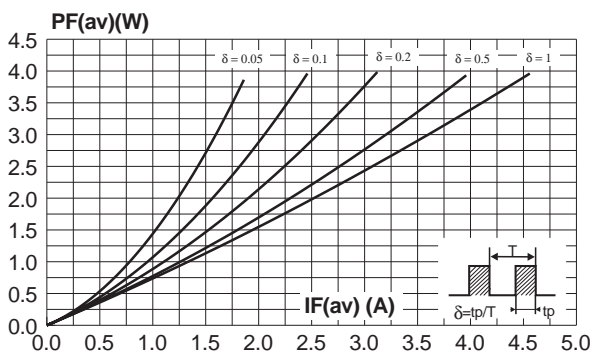
To evaluate the maximum conduction losses use the following equation :

$$P = 0.7 \times I_{F(AV)} + 0.037 I_F^2(RMS)$$

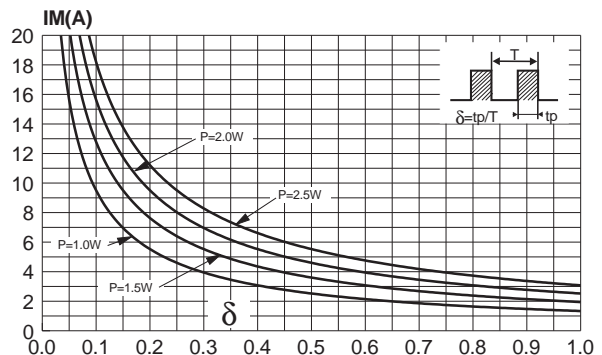
### RECOVERY CHARACTERISTICS

Symbol	Test Conditions			Min.	Typ.	Max.	Unit
$t_{rr}$	$T_j = 25^\circ\text{C}$	$I_F = 1\text{ A}$ $V_F = 30\text{ V}$	$di_F/dt = -50\text{ A}/\mu\text{s}$		26	35	ns
$t_{fr}$	$T_j = 25^\circ\text{C}$	$I_F = 4\text{ A}$ $V_{RR} = 1.1 \times V_F \text{ max}$	$di_F/dt = -50\text{ A}/\mu\text{s}$		20		ns
$V_{FP}$	$T_j = 25^\circ\text{C}$	$I_F = 4\text{ A}$	$di_F/dt = -50\text{ A}/\mu\text{s}$		5		V

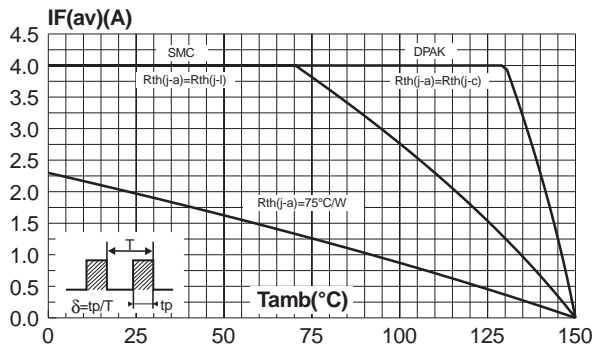
**Fig. 1:** Average forward power dissipation versus average forward current.



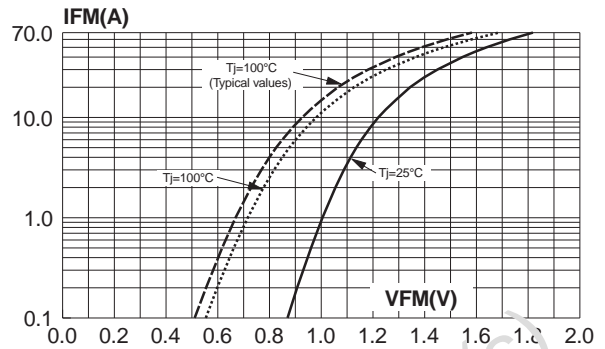
**Fig. 2:** Peak current versus form factor.



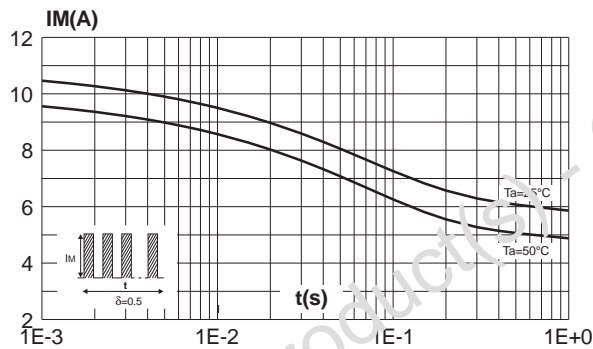
**Fig. 3:** Average forward current versus ambient temperature ( $\delta=0.5$ ).



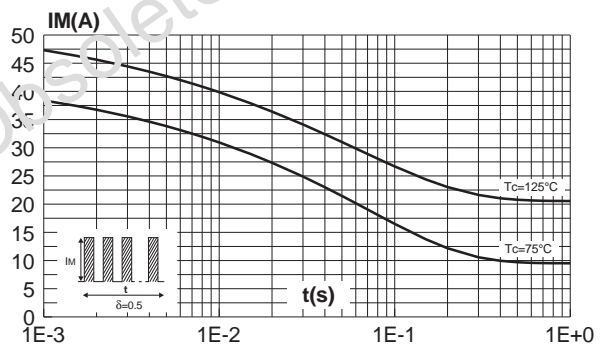
**Fig. 4:** Forward voltage drop versus forward current (maximum values).



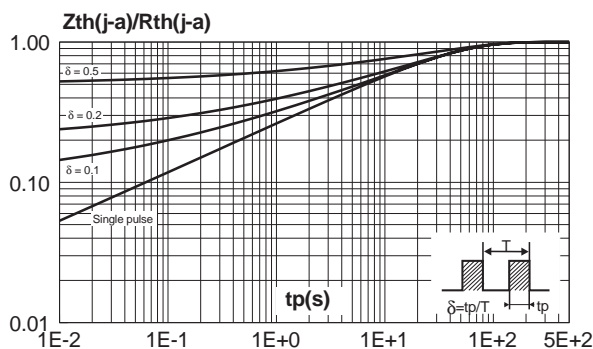
**Fig. 5-1:** Non repetitive surge peak forward current versus overload duration (SMBYW04-200).



**Fig. 5-2:** Non repetitive surge peak forward current versus overload duration (BYW4200B).



**Fig. 6-1:** Variation of thermal impedance junction to ambient versus pulse duration (recommended pad layout, epoxy FR4, e(Cu)=35µm) (SMBYW04-200).



**Fig. 6-2:** Variation of thermal impedance junction to case versus pulse duration (BYW4200B).

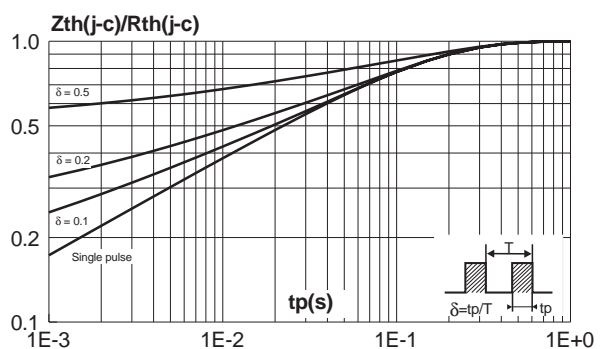


Fig. 7: Reverse recovery current versus  $dI_F/dt$ .

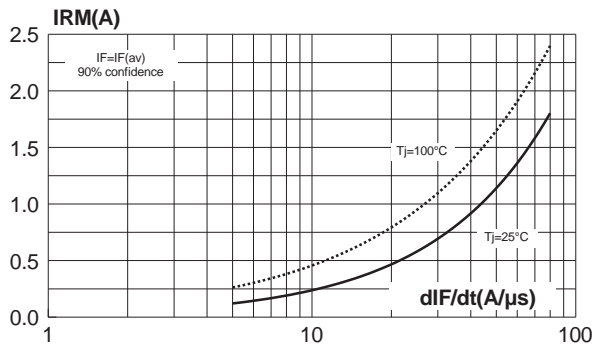


Fig. 8: Reverse recovery time versus  $dI_F/dt$ .

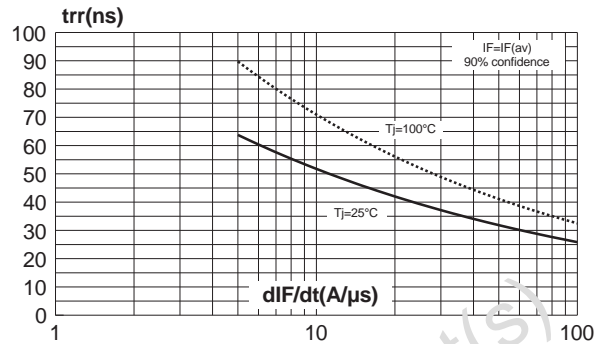


Fig. 9: Junction capacitance versus reverse voltage applied (typical values).

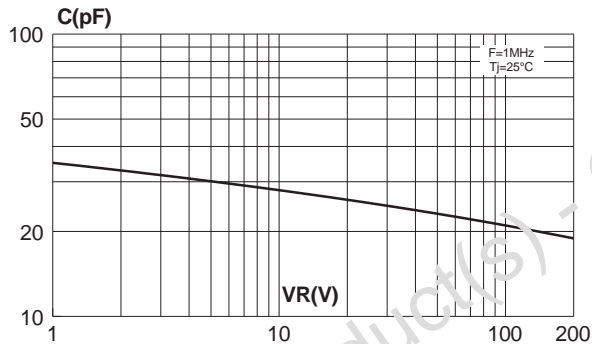


Fig. 10: Dynamic parameters versus junction temperature.

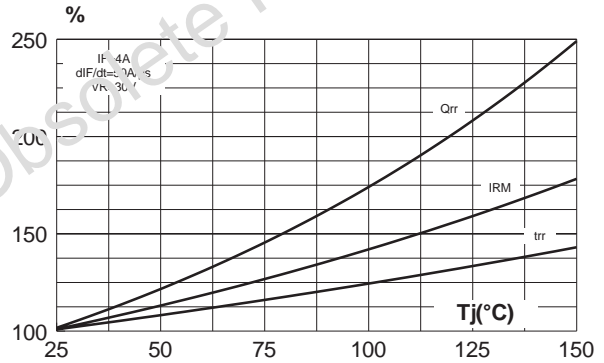


Fig. 11-1: Thermal resistance junction to ambient versus copper surface under each lead (Epoxy printed circuit board FR4, copper thickness: 35mm) (SMBYW04-200).

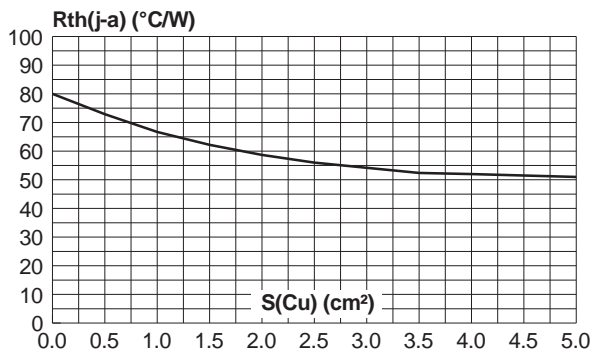
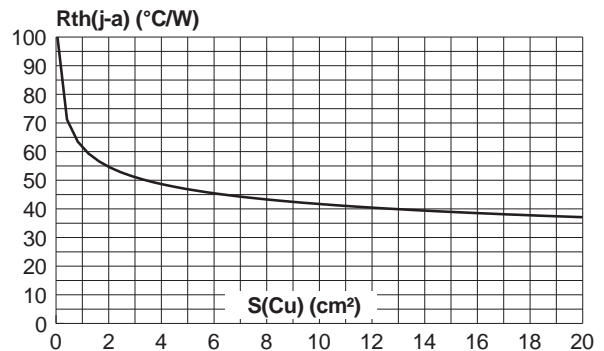
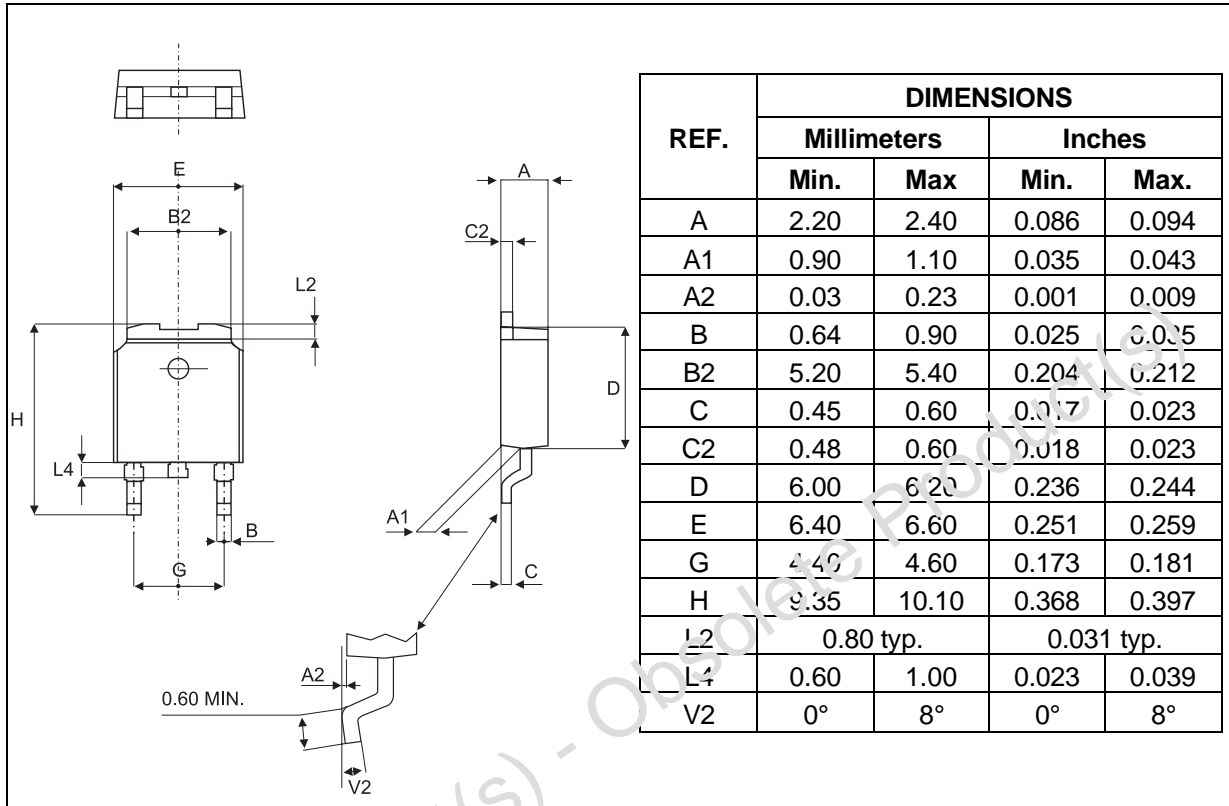


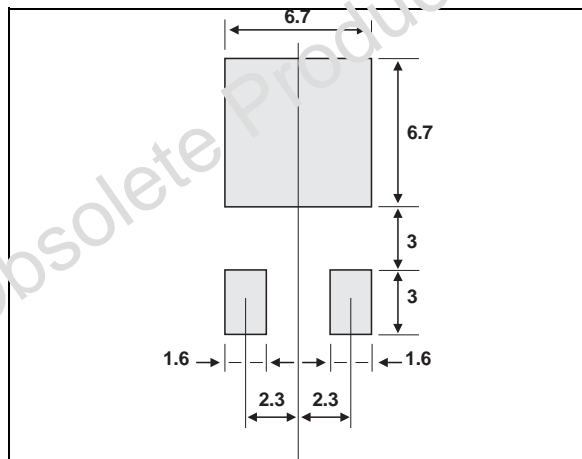
Fig. 11-2: Thermal resistance junction to ambient versus copper surface under tab (Epoxy printed circuit board FR4, copper thickness: 35mm) (BYW4200B).



**PACKAGE MECHANICAL DATA**  
DPAK



**FOOT PRINT (in millimeters)**



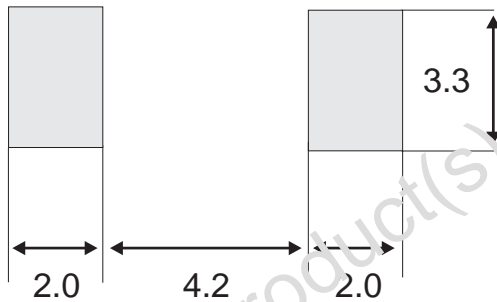
## SMBYW04-200 / BYW4200B

### PACKAGE MECHANICAL DATA

SMC

REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A1	1.90	2.45	0.075	0.096
A2	0.05	0.20	0.002	0.008
b	2.90	3.2	0.114	0.126
c	0.15	0.41	0.006	0.016
E	7.75	8.15	0.305	0.321
E1	6.60	7.15	0.260	0.281
E2	4.40	4.70	0.173	0.185
D	5.55	6.25	0.219	0.246
L	0.75	1.60	0.030	0.063

### FOOT PRINT (in millimeters)



Ordering code	Marking	Package	Weight	Base qty	Delivery mode
SMBYW04-200	D20	SMC	0.243g	2500	Tape and reel
BYW4200B	W4200	DPAK	0.30g	75	Tube
BYW4200B-RL	W4200	DPAK	0.30g	2500	Tape and reel

- Epoxy meets UL 94,V0
- Band indicates cathode

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