



SMBYW04-200 BYW4200B

HIGH EFFICIENCY FAST RECOVERY DIODE

MAIN PRODUCT CHARACTERISTICS

$I_{F(AV)}$	4 A
V_{RRM}	200 V
$V_F (max)$	0.85 V
$T_j (max)$	150 °C

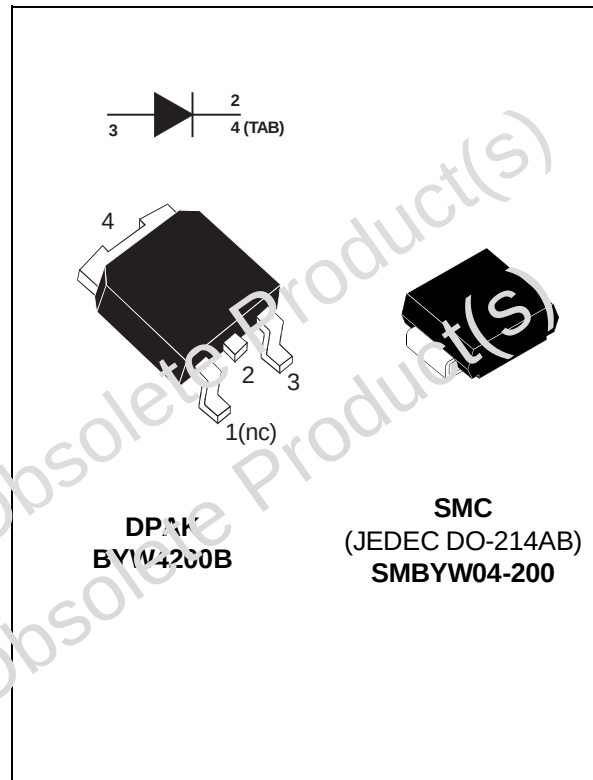
FEATURES AND BENEFITS

- 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)

Symbo	Parameter			Value	Unit
V_{RRM}	Repetitive peak reverse voltage			200	V
$I_{F(RMS)}$	RMS forward current			10	A
$I_{F(AV)}$	Average forward current $\delta = 0.5$	DPAK SMC	$T_{case} = 130^{\circ}C$ $T_{lead} = 70^{\circ}C$	4	A
I_{FSM}	Surge non repetitive forward current		$t_p = 10\text{ ms}$ sinusoidal	70	A
T_{stg}	Storage temperature range			- 65 to + 150	°C
T_j	Maximum operating junction temperature			150	°C

THERMAL RESISTANCE

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

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	μA
		$T_j = 100^{\circ}\text{C}$		0.15	0.5	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.

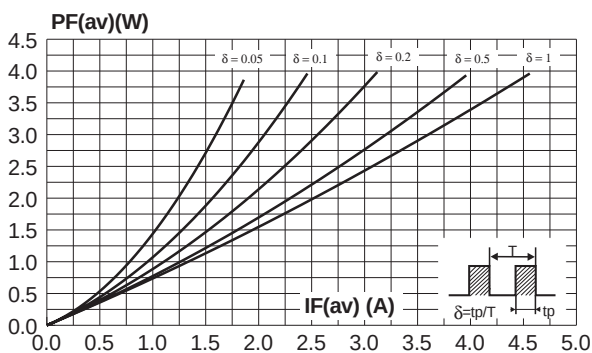


Fig. 2: Peak current versus form factor.

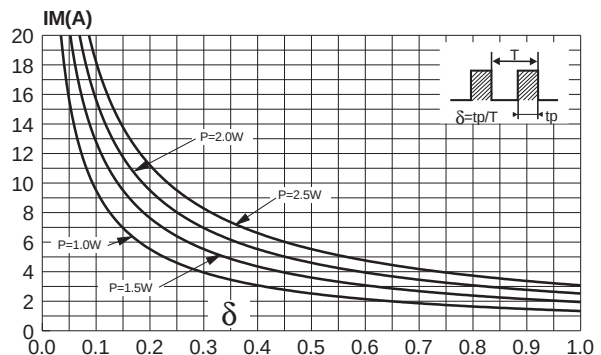


Fig. 3: Average forward current versus ambient temperature ($\delta=0.5$).

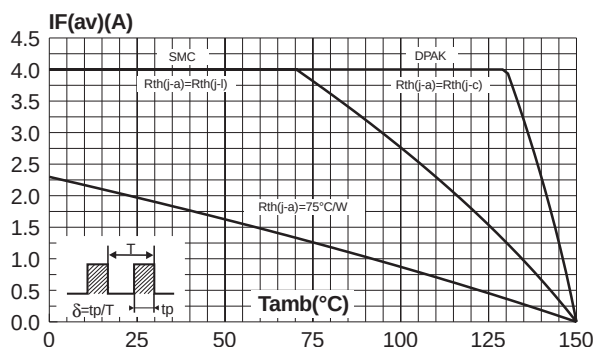


Fig. 4: Forward voltage drop versus forward current (maximum values).

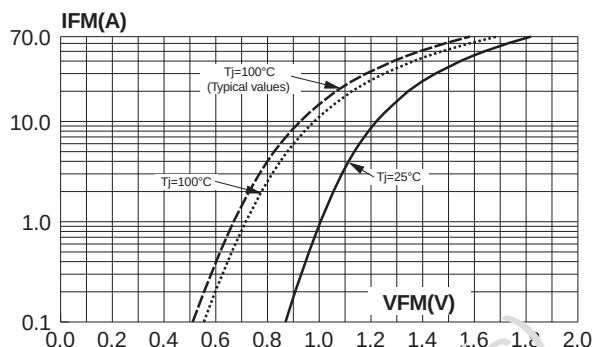


Fig. 5-1: Non repetitive surge peak forward current versus overload duration (SMBYW04-200).

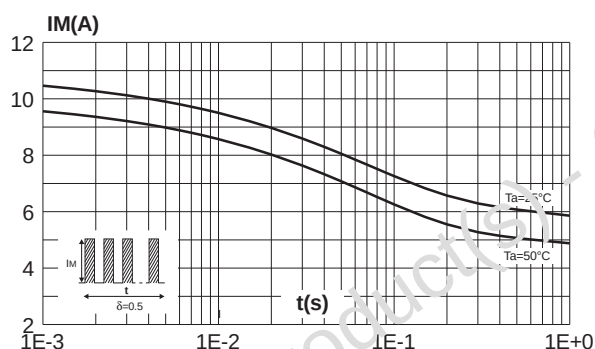


Fig. 5-2: Non repetitive surge peak forward current versus overload duration (BYW4200B).

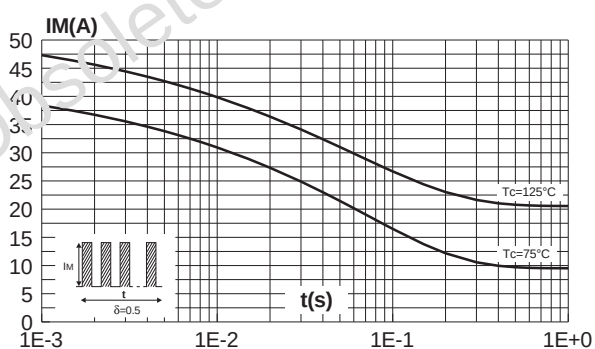


Fig. 6-1: Variation of thermal impedance junction to ambient versus pulse duration (recommended pad layout, epoxy FR4, e(Cu)=35μm) (SMBYW04-200).

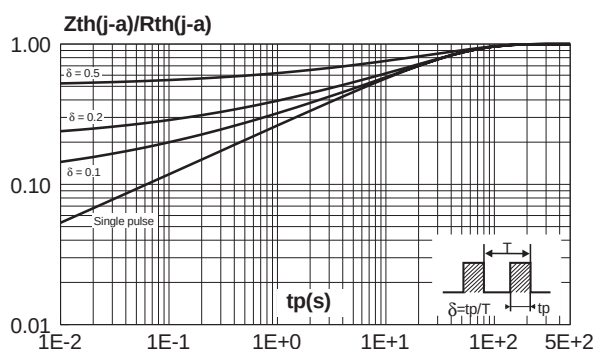


Fig. 6-2: Variation of thermal impedance junction to case versus pulse duration (BYW4200B).

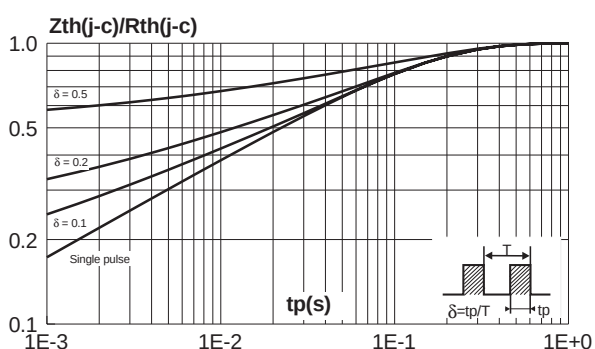


Fig. 7: Reverse recovery current versus dI_F/dt .

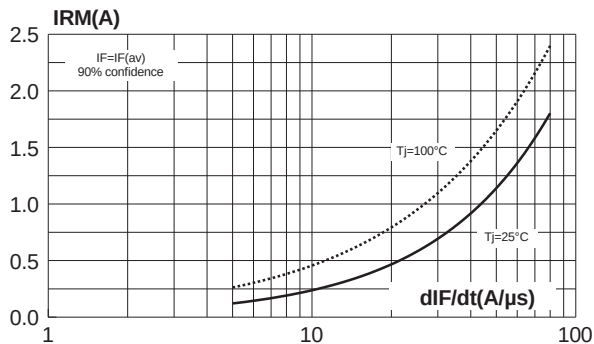


Fig. 8: Reverse recovery time versus dI_F/dt .

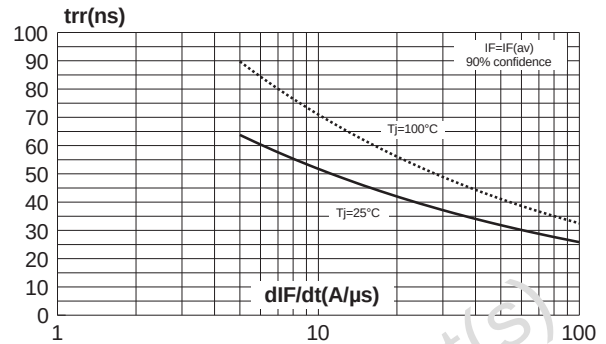


Fig. 9: Junction capacitance versus reverse voltage applied (typical values).

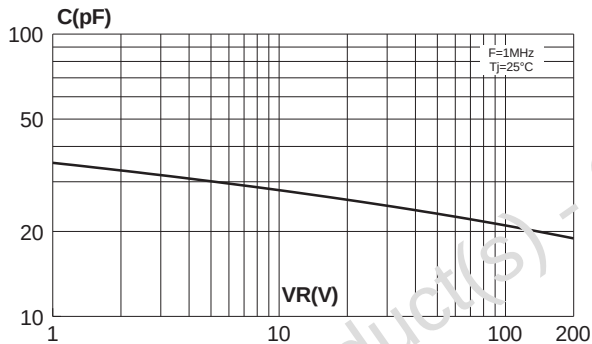


Fig. 10: Dynamic parameters versus junction temperature.

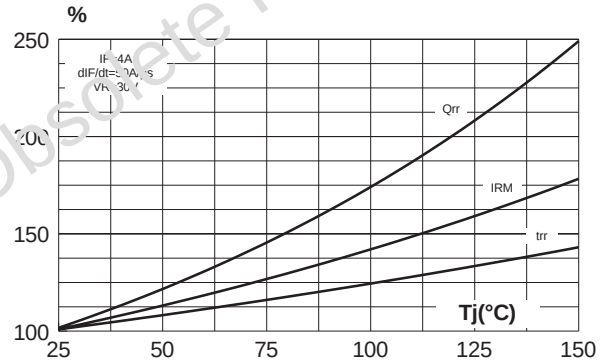


Fig. 11-1: Thermal resistance junction to ambient versus copper surface under each lead (Epoxy printed circuit board FR4, copper thickness: 35mm) (SMBYW04-200).

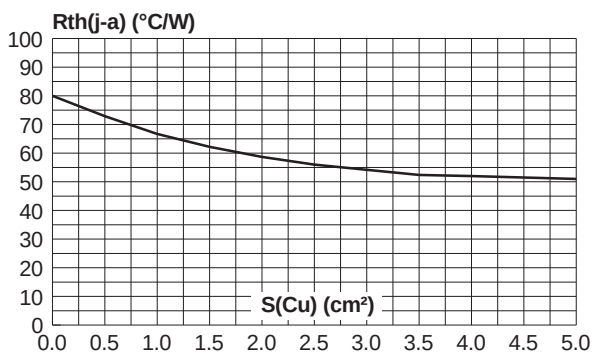
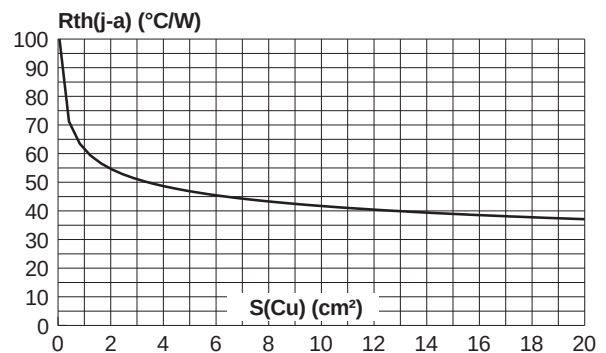
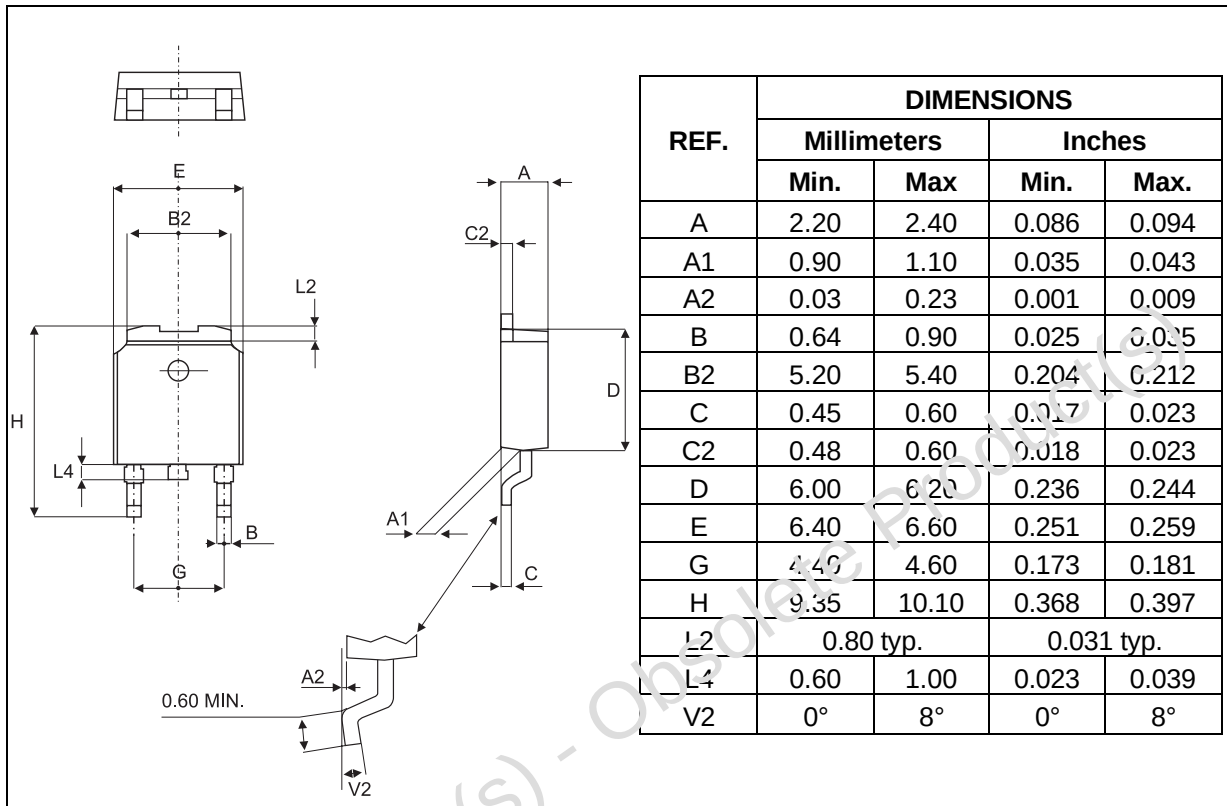
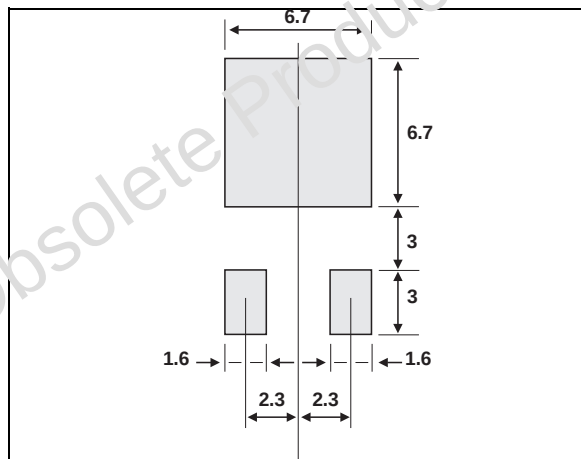


Fig. 11-2: Thermal resistance junction to ambient versus copper surface under tab (Epoxy printed circuit board FR4, copper thickness: 35mm) (BYW4200B).



PACKAGE MECHANICAL DATA

DPAK

**FOOT PRINT (in millimeters)**

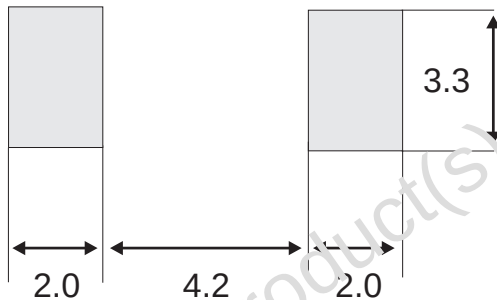
SMBYW04-200 / BYW4200B

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

Information furnished is believed to be accurate and reliable. However, STMicroelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of STMicroelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. STMicroelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of STMicroelectronics.

The ST logo is a registered trademark of STMicroelectronics

© 1999 STMicroelectronics - Printed in Italy - All rights reserved.

STMicroelectronics GROUP OF COMPANIES

Australia - Brazil - China - Finland - France - Germany - Hong Kong - India - Italy - Japan - Malaysia
Malta - Morocco - Singapore - Spain - Sweden - Switzerland - United Kingdom - U.S.A.

<http://www.st.com>