

## SMBYW04-200 / BYW4200B

### 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   | $\mu\text{A}$ |
|          |                         | $T_j = 100^{\circ}\text{C}$ |                     | 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 : \*  $t_p = 5\text{ ms}$ ,  $\delta < 2\%$   
 \*\*  $t_p = 380\text{ }\mu\text{s}$ ,  $\delta < 2\%$

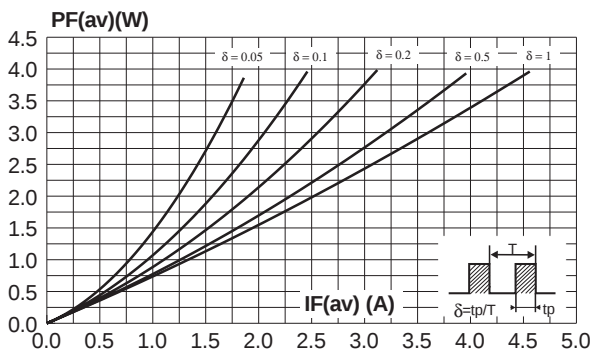
To evaluate the maximum conduction losses use the following equation :

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

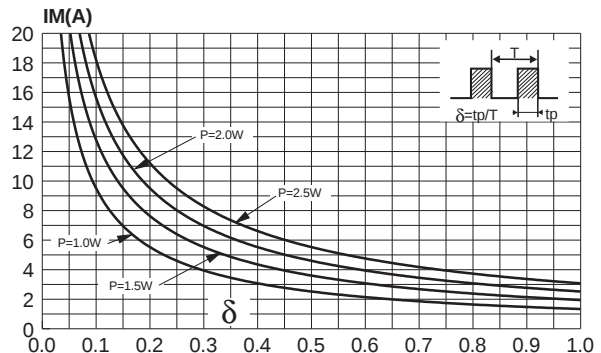
### RECOVERY CHARACTERISTICS

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

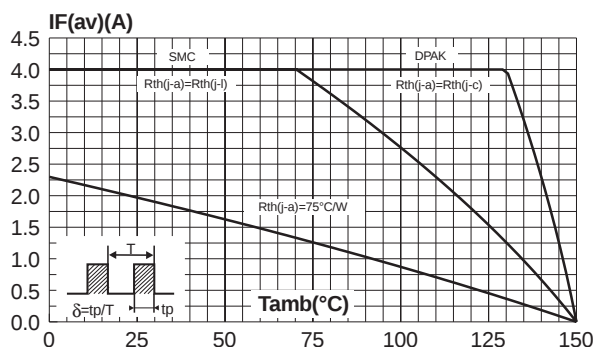
**Fig. 1:** Average forward power dissipation versus average forward current.



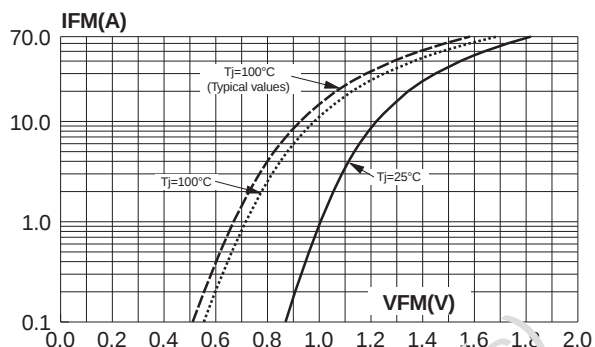
**Fig. 2:** Peak current versus form factor.



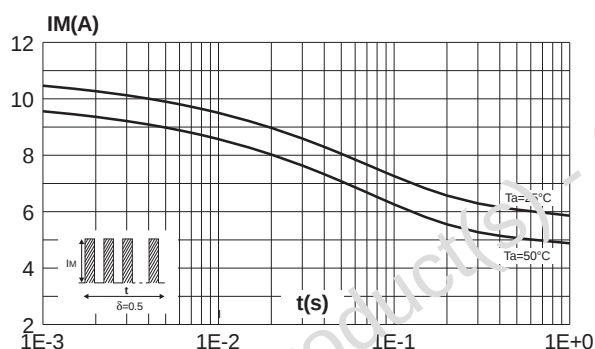
**Fig. 3:** Average forward current versus ambient temperature ( $\delta=0.5$ ).



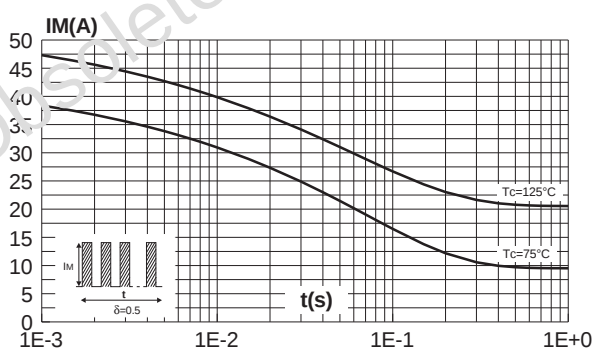
**Fig. 4:** Forward voltage drop versus forward current (maximum values).



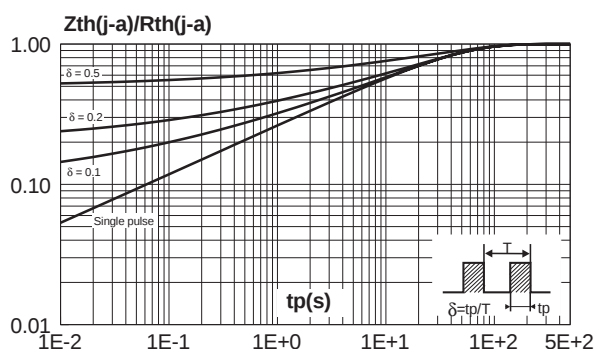
**Fig. 5-1:** Non repetitive surge peak forward current versus overload duration (SMBYW04-200).



**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).

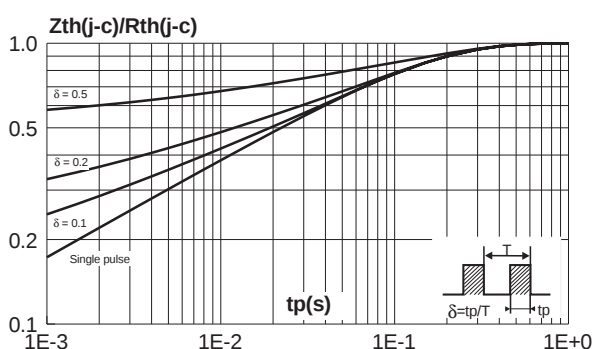


Fig. 7: Reverse recovery current versus  $dI_F/dt$ .

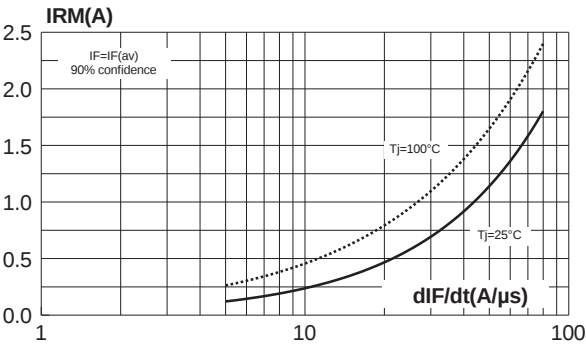


Fig. 8: Reverse recovery time versus  $dI_F/dt$ .

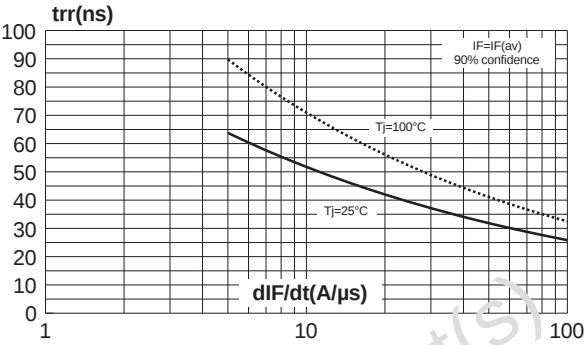


Fig. 9: Junction capacitance versus reverse voltage applied (typical values).

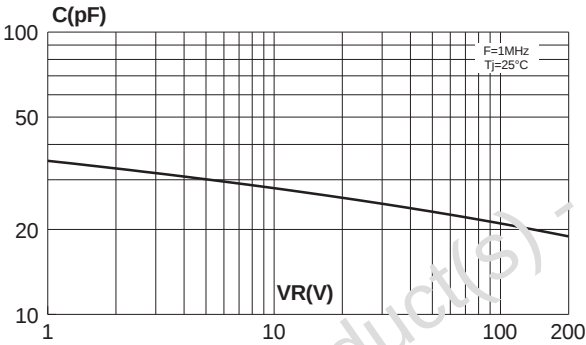


Fig. 10: Dynamic parameters versus junction temperature.

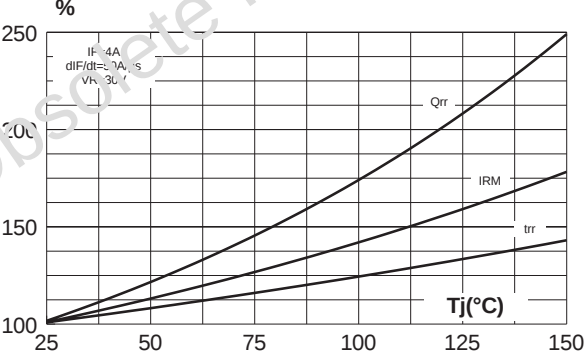


Fig. 11-1: Thermal resistance junction to ambient versus copper surface under each lead (Epoxy printed circuit board FR4, copper thickness: 35mm) (SMBYW04-200).

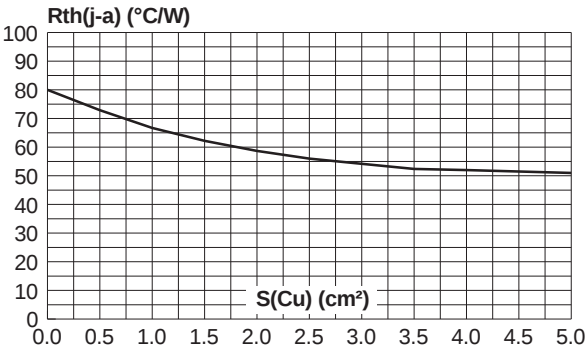
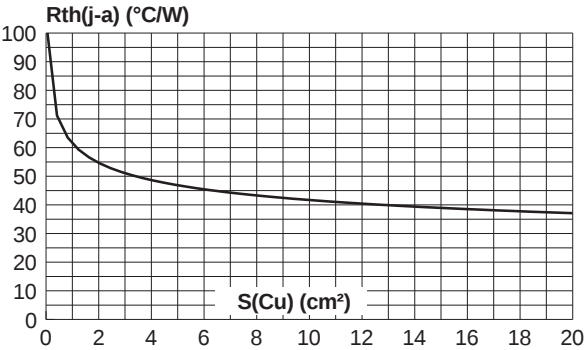
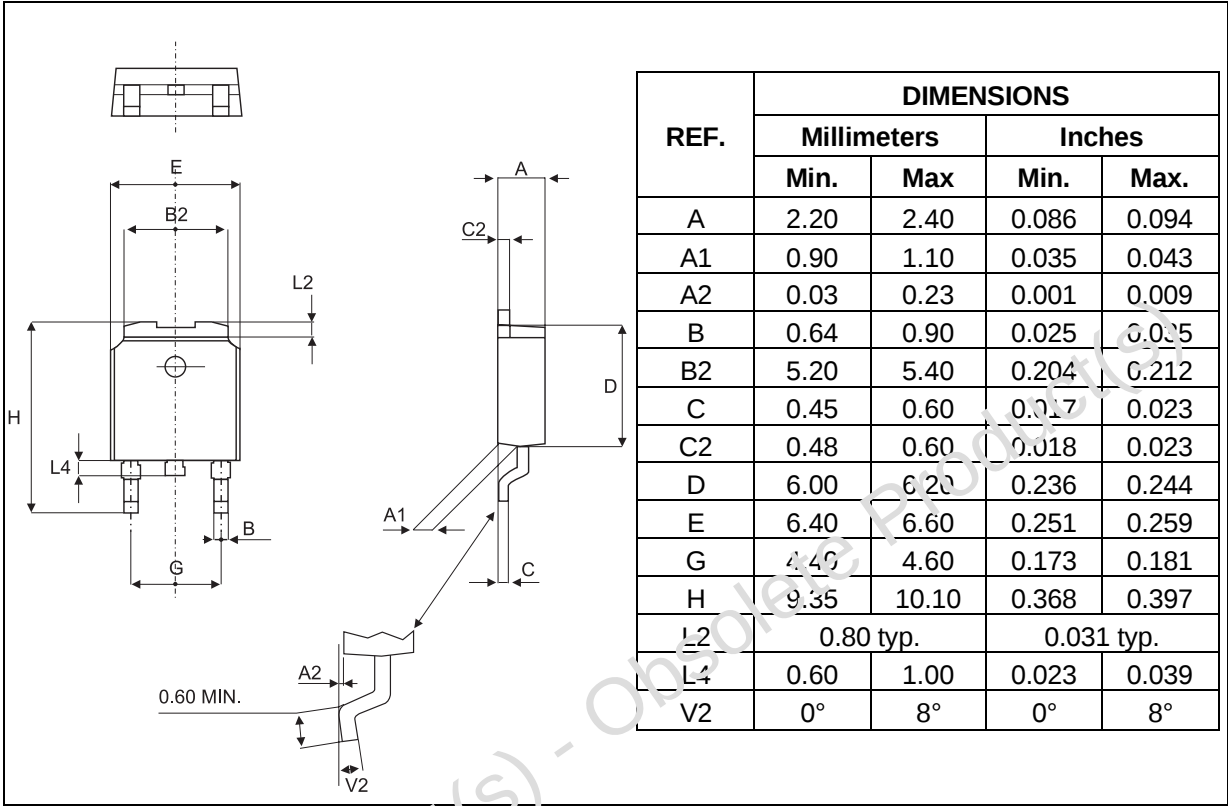


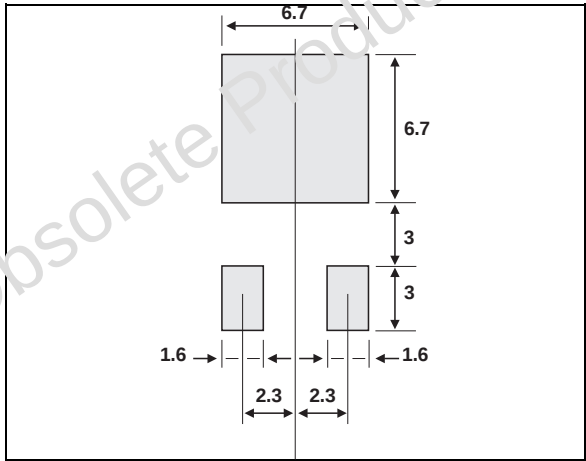
Fig. 11-2: Thermal resistance junction to ambient versus copper surface under tab (Epoxy printed circuit board FR4, copper thickness: 35mm) (BYW4200B).



PACKAGE MECHANICAL DATA  
DPAK



FOOT PRINT (in millimeters)



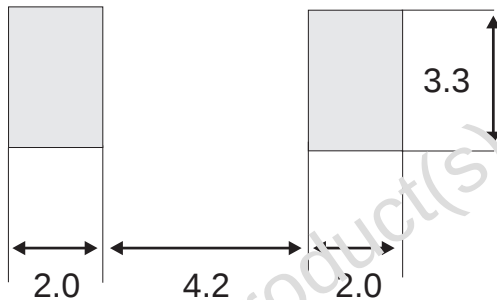
## SMBYW04-200 / BYW4200B

### 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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