



## SMBYW04-200

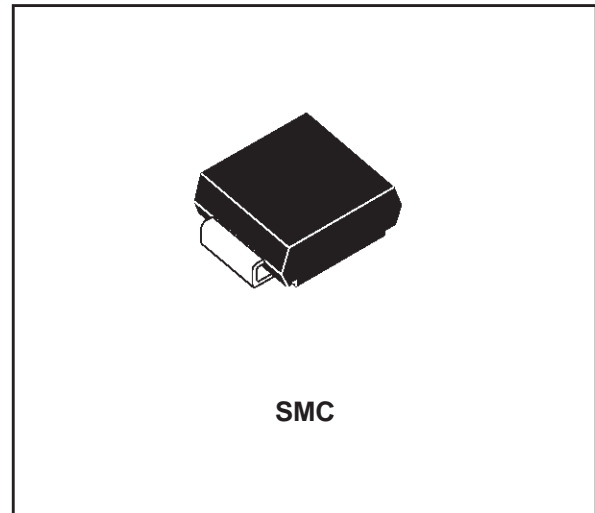
### HIGH EFFICIENCY FAST RECOVERY RECTIFIER DIODES

#### FEATURES

- SUITED FOR SMPS
- VERY LOW FORWARD LOSSES
- NEGLIGIBLE SWITCHING LOSSES
- HIGH SURGE CURRENT CAPABILITY
- HIGH AVALANCHE ENERGY CAPABILITY
- SURFACE MOUNT DEVICE

#### DESCRIPTION

Single chip rectifier suited for Switch Mode Power Supply and high frequency DC to DC converters. Packaged in SMC, this surface mount device is intended for use in low voltage, high frequency inverters, free wheeling and polarity protection applications.



#### ABSOLUTE MAXIMUM RATINGS

| Symbol             | Parameter                                 | Value                               | Unit                       |
|--------------------|---|-------------------------------------|----------------------------|
| $I_{F(RMS)}$       | RMS forward current                       | 10                                  | A                          |
| $I_{F(AV)}$        | Average forward current                   | $T_I=70^{\circ}C$<br>$\delta = 0.5$ | A                          |
| $I_{FSM}$          | Non repetitive surge peak forward current | $t_p=10ms$<br>sinusoidal            | A                          |
| $T_{stg}$<br>$T_j$ | Storage and junction temperature range    | - 40 to + 150<br>- 40 to + 150      | $^{\circ}C$<br>$^{\circ}C$ |

| Symbol    | Parameter                       | Value | Unit |
|-----------|---------------------------------|-------|------|
| $V_{RRM}$ | Repetitive peak reverse voltage | 200   | V    |

#### THERMAL RESISTANCE

| Symbol        | Parameter      | Value | Unit          |
|---------------|----------------|-------|---------------|
| $R_{th(j-l)}$ | Junction-leads | 20    | $^{\circ}C/W$ |

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### ELECTRICAL CHARACTERISTICS STATIC CHARACTERISTICS

| Symbol   | Test Conditions           |                     | Min. | Typ. | Max. | Unit          |
|----------|---------------------------|---------------------|------|------|------|---------------|
| $V_F$ *  | $T_j = 25^\circ\text{C}$  | $I_F = 12\text{ A}$ |      |      | 1.25 | V             |
|          | $T_j = 100^\circ\text{C}$ | $I_F = 4\text{ A}$  |      | 0.8  | 0.85 |               |
| $I_R$ ** | $T_j = 25^\circ\text{C}$  | $V_R = V_{RRM}$     |      |      | 10   | $\mu\text{A}$ |
|          | $T_j = 100^\circ\text{C}$ |                     |      | 0.15 | 0.5  | mA            |

Pulse test : \*  $t_p = 380\ \mu\text{s}$ , duty cycle < 2 %

\*\*  $t_p = 5\text{ ms}$ , duty cycle < 2 %

### RECOVERY CHARACTERISTICS

| Symbol   | Test Conditions          |   | Min. | Typ. | Max. | Unit |
|----------|--------------------------|---|------|------|------|------|
| trr      | $T_j = 25^\circ\text{C}$ | $I_F = 1\text{ A}$<br>$V_R = 30\text{ V}$<br>$dI_F/dt = -50\text{ A}/\mu\text{s}$ |      | 26   | 35   | ns   |
| tfr      | $T_j = 25^\circ\text{C}$ | $I_F = 1\text{ A}$<br>$V_{FR} = 1.1 \times V_F$<br>$t_r = 10\text{ ns}$           |      | 20   |      | ns   |
| $V_{FP}$ | $T_j = 25^\circ\text{C}$ | $I_F = 1\text{ A}$<br>$t_r = 10\text{ ns}$  |      | 5    |      | V    |

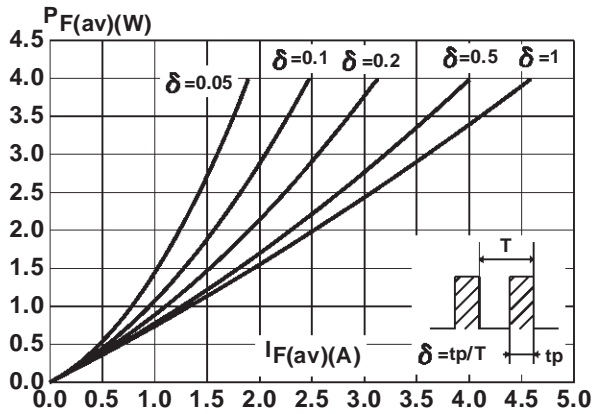
To evaluate the conduction losses use the following equation :

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

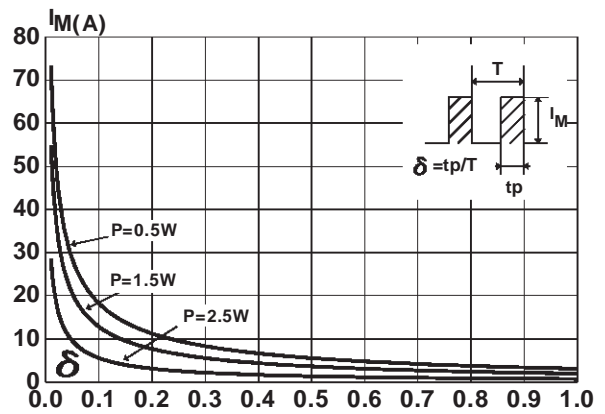
|                    |     |
|--------------------|-----|
| <b>Voltage (V)</b> | 200 |
| <b>Marking</b>     | D20 |

Laser marking  
Logo indicates cathode

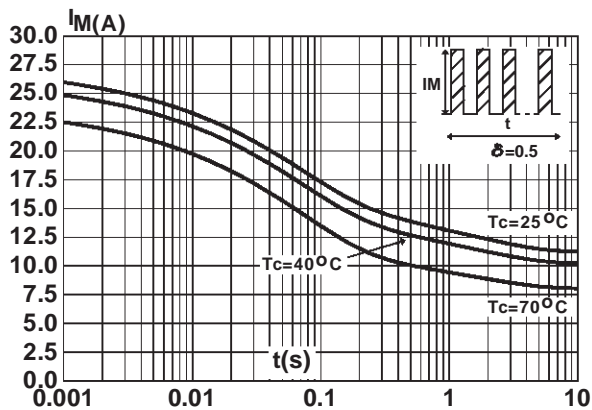
**Fig.1 :** Low frequency power losses versus average current.



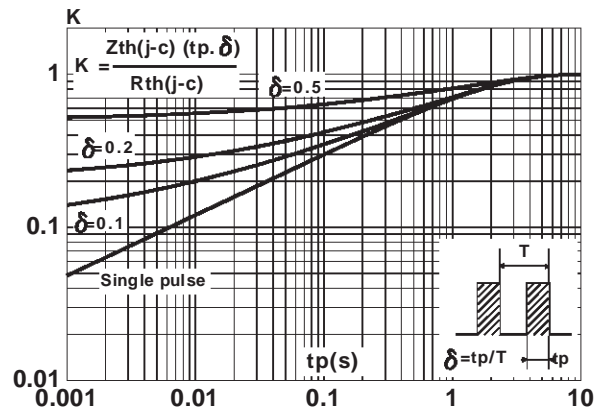
**Fig.2 :** Peak current versus form factor.



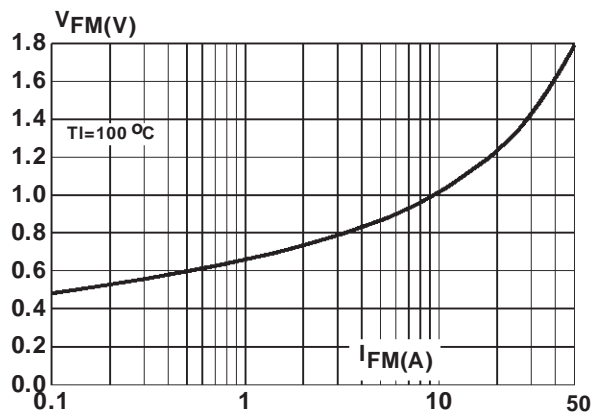
**Fig.3 :** Non repetitive surge peak forward current versus overload duration.



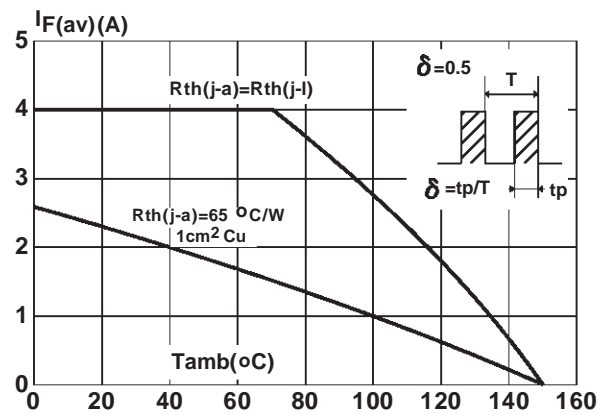
**Fig.4 :** Relative variation of thermal impedance junction to lead versus pulse duration.



**Fig.5 :** Voltage drop versus forward current. (Maximum values)

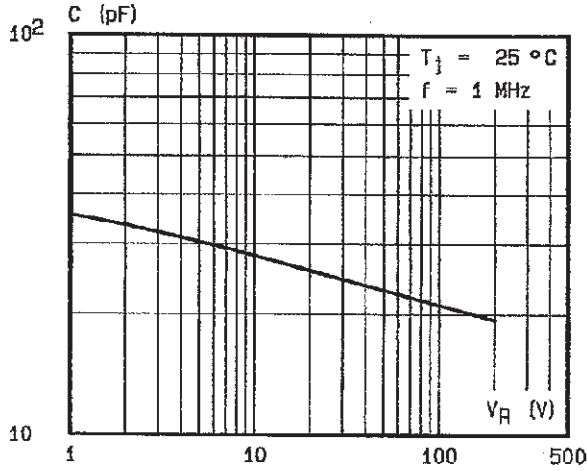


**Fig.6 :** Average current versus ambient temperature. (duty cycle : 0.5)

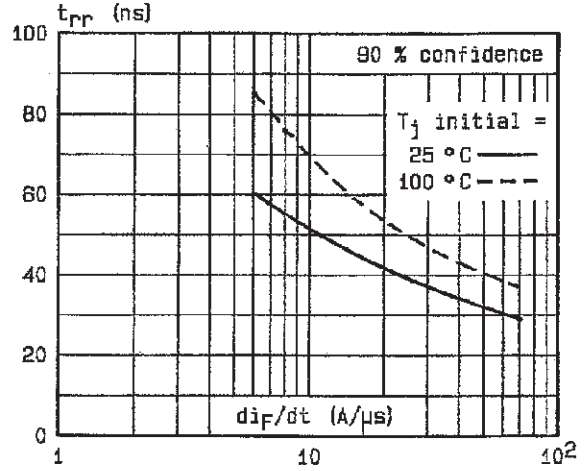


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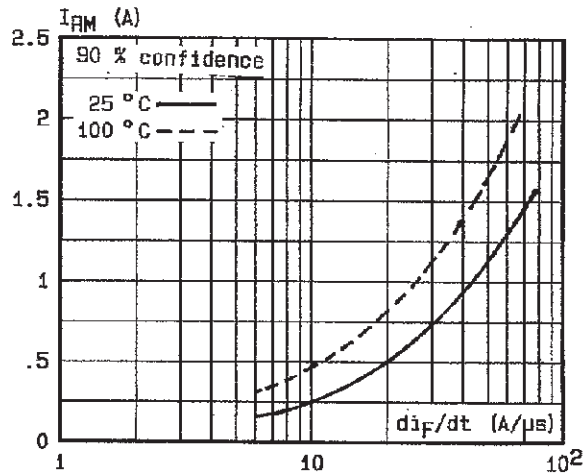
**Fig.7 :** Capacitance versus reverse voltage applied.



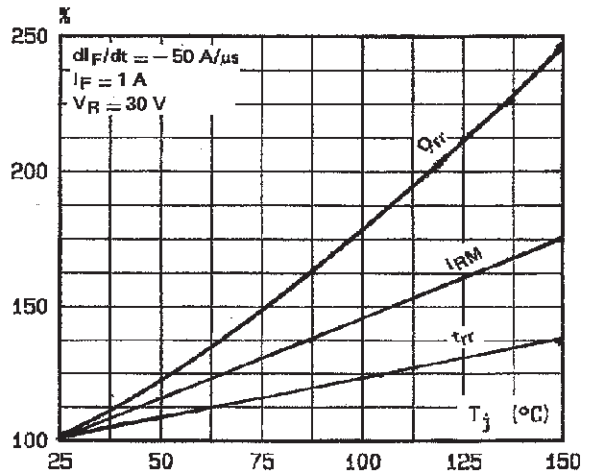
**Fig.8 :** Recovery time versus  $di_F/dt$ .



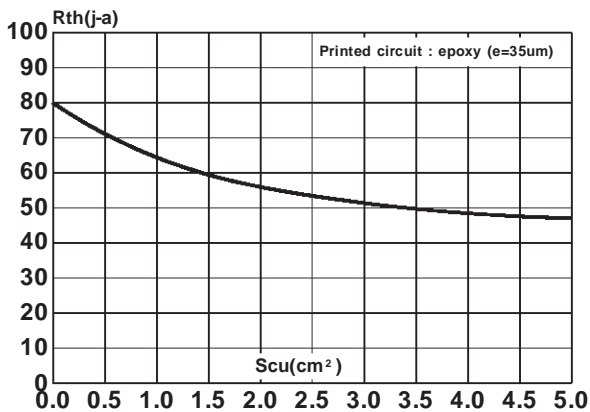
**Fig.9 :** Peak reverse current versus  $di_F/dt$ .



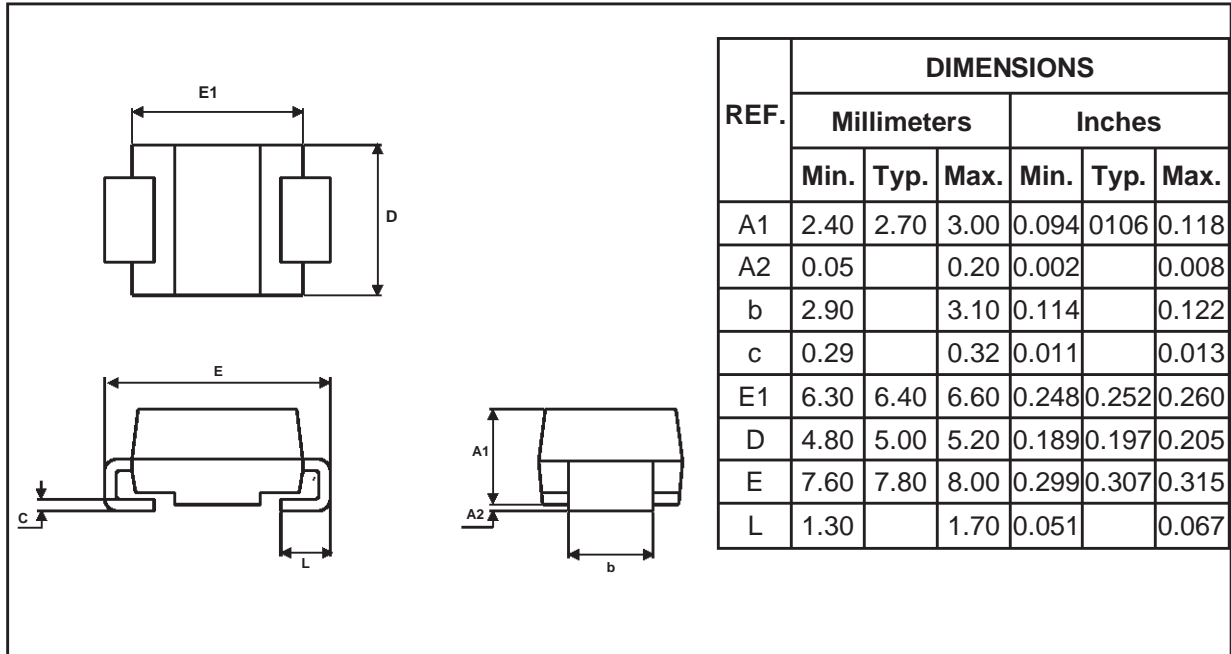
**Fig.10 :** Dynamic parameters versus junction temperature.



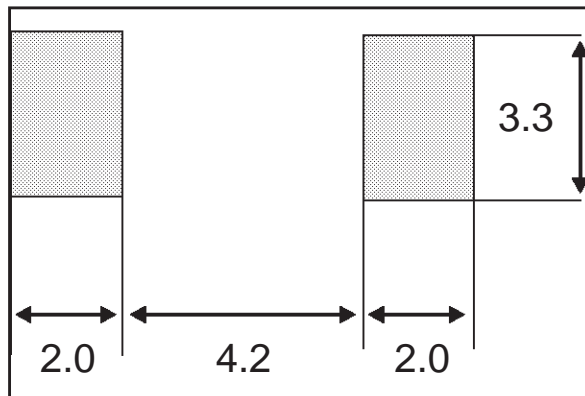
**Fig.11 :** Thermal resistance junction to ambient versus copper surface under each lead.



**PACKAGE MECHANICAL DATA**  
SMC



**FOOTPRINT DIMENSIONS**  
SMC



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