

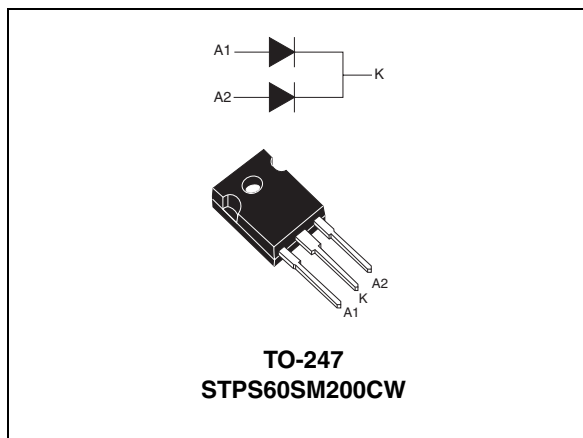
### Features

- High reverse voltage (200 V)
- Low forward voltage drop
- High frequency operation

### Description

The STPS60SM200C is a dual Schottky rectifier suited for high frequency switched-mode power supply.

Housed in TO-247, this device is especially suited for use in telecom base station SMPS, providing these applications with a good efficiency at both low and high load.



**Table 1. Device summary**

| Symbol      | Value    |
|-------------|----------|
| $I_{F(AV)}$ | 2 x 30 A |
| $V_{RRM}$   | 200 V    |
| $T_j$ (max) | 175 °C   |
| $V_F$ (typ) | 640 mV   |

# 1 Characteristics

**Table 2. Absolute ratings (limiting values per diode at 25 °C, unless otherwise specified)**

| Symbol              | Parameter                                             |                                                           |                         | Value        | Unit |
|---------------------|-------------------------------------------------------|-----------------------------------------------------------|-------------------------|--------------|------|
| V <sub>RRM</sub>    | Repetitive peak reverse voltage                       |                                                           |                         | 200          | V    |
| I <sub>F(RMS)</sub> | Forward current rms                                   |                                                           |                         | 50           | A    |
| I <sub>F(AV)</sub>  | Average forward current δ = 0.5                       | Per diode, δ = 0.5                                        | T <sub>c</sub> = 155 °C | 30           | A    |
|                     |                                                       | per device, δ = 0.5                                       | T <sub>c</sub> = 150 °C | 60           |      |
| I <sub>FSM</sub>    | Surge non repetitive forward current                  | t <sub>p</sub> = 10 ms sinusoidal, T <sub>c</sub> = 25 °C |                         | 500          | A    |
| T <sub>stg</sub>    | Storage temperature range                             |                                                           |                         | -65 to + 175 | °C   |
| T <sub>j</sub>      | Maximum operating junction temperature <sup>(1)</sup> |                                                           |                         | -40 to + 175 | °C   |

1.  $\frac{dP_{tot}}{dT_j} < \frac{1}{R_{th(j-a)}}$  condition to avoid thermal runaway for a diode on its own heatsink

**Table 3. Thermal resistance**

| Symbol        | Parameter        |           | Value | Unit |
|---------------|------------------|-----------|-------|------|
| $R_{th(j-c)}$ | Junction to case | Per diode | 0.7   | °C/W |
|               |                  | Total     | 0.5   |      |
| $R_{th(c)}$   | Coupling         |           | 0.3   |      |

When the two diodes 1 and 2 are used simultaneously:

$$\Delta T_j(\text{diode 1}) = P(\text{diode 1}) \times R_{th(j-c)}(\text{Per diode}) + P(\text{diode 2}) \times R_{th(c)}$$

**Table 4. Static electrical characteristics (per diode)**

| Symbol      | Parameter               | Test conditions       |                      | Min. | Typ. | Max. | Unit |
|-------------|-------------------------|-----------------------|----------------------|------|------|------|------|
| $I_R^{(1)}$ | Reverse leakage current | $T_j = 25\text{ °C}$  | $V_R = V_{RRM}$      |      |      | 0.05 | mA   |
|             |                         | $T_j = 125\text{ °C}$ |                      |      | 6    | 13   |      |
| $V_F^{(2)}$ | Forward voltage drop    | $T_j = 25\text{ °C}$  | $I_F = 7.5\text{ A}$ |      | 0.67 | 0.70 | V    |
|             |                         | $T_j = 125\text{ °C}$ |                      |      | 0.51 | 0.55 |      |
|             |                         | $T_j = 25\text{ °C}$  | $I_F = 15\text{ A}$  |      | 0.73 | 0.77 |      |
|             |                         | $T_j = 125\text{ °C}$ |                      |      | 0.57 | 0.61 |      |
|             |                         | $T_j = 25\text{ °C}$  | $I_F = 30\text{ A}$  |      | 0.79 | 0.83 |      |
|             |                         | $T_j = 125\text{ °C}$ |                      |      | 0.64 | 0.69 |      |

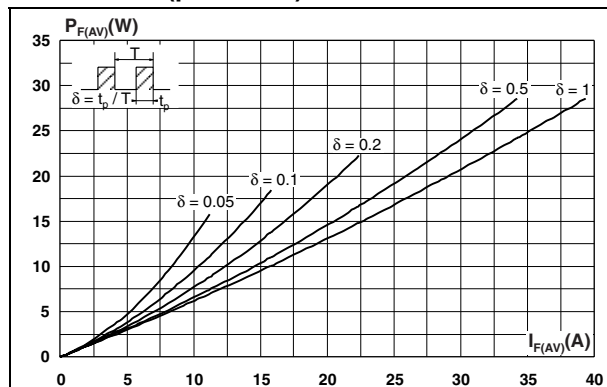
1. Pulse test:  $t_p = 5\text{ ms}$ ,  $\delta < 2\%$

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

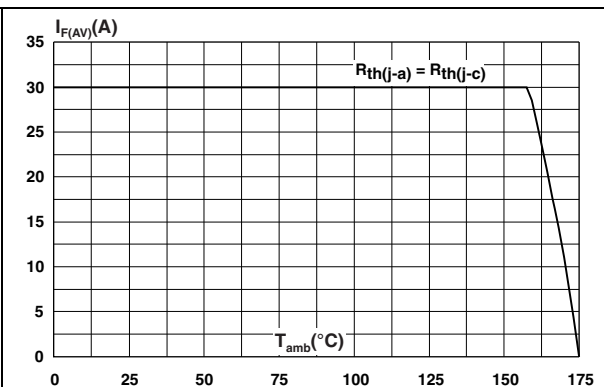
To evaluate the conduction losses use the following equation:

$$P = 0.58 \times I_{F(AV)} + 0.0037 \times I_{F(RMS)}^2$$

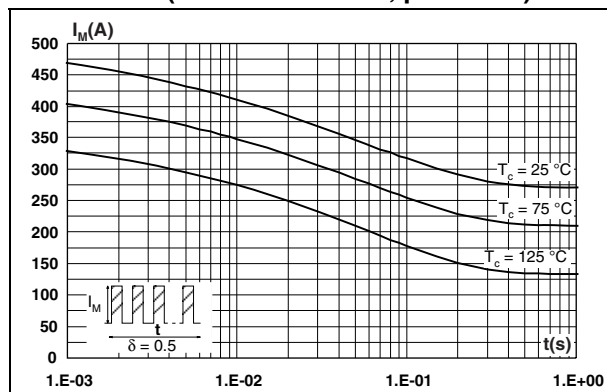
**Figure 1. Average forward power dissipation versus average forward current (per diode)**



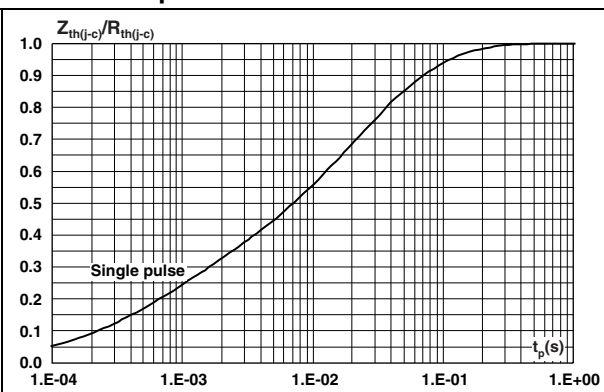
**Figure 2. Average forward current versus ambient temperature ( $\delta = 0.5$ )**



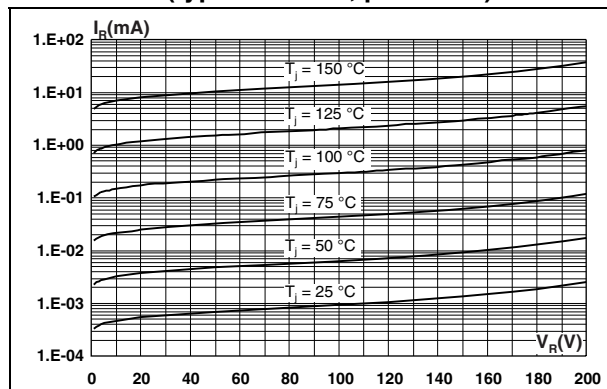
**Figure 3. Non repetitive surge peak forward current versus overload duration (maximum values, per diode)**



**Figure 4. Relative variation of thermal impedance junction to case versus pulse duration**



**Figure 5. Reverse leakage current versus reverse voltage applied (typical values, per diode)**



**Figure 6. Junction capacitance versus reverse voltage applied (typical values, per diode)**

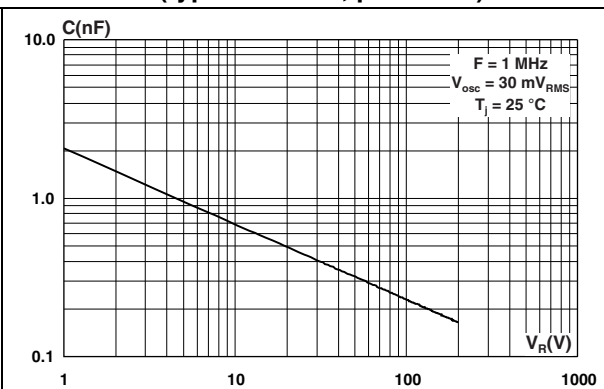


Figure 7. Forward voltage drop versus forward current (per diode, low level)

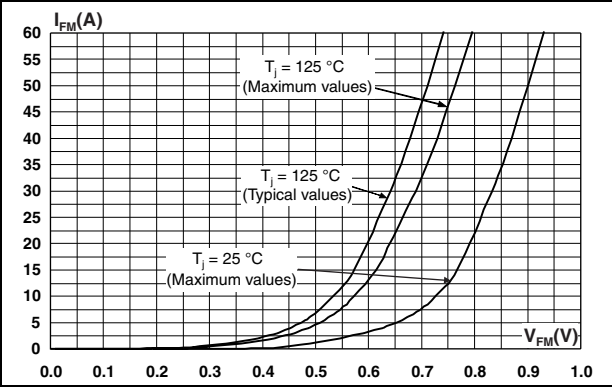
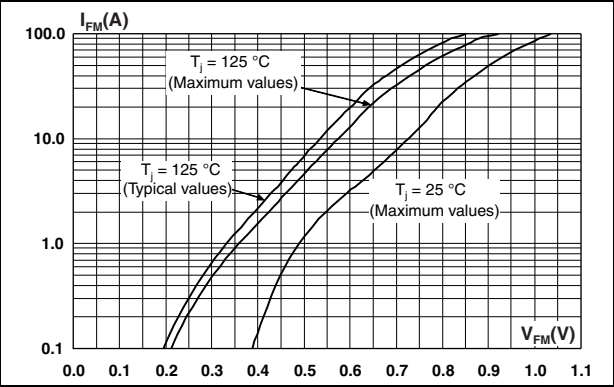


Figure 8. Forward voltage drop versus forward current (per diode, high level)



## 2 Package information

- Epoxy meets UL94, V0
- Cooling method: by conduction (C)
- Recommended torque value: 0.55 to 1.0 N·m

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**Table 5. TO-247 dimensions**

| Ref. | Dimensions  |       |            |       |
|------|-------------|-------|------------|-------|
|      | Millimeters |       | Inches     |       |
|      | Min.        | Max.  | Min.       | Max.  |
| A    | 4.85        | 5.16  | 0.191      | 0.203 |
| D    | 2.20        | 2.60  | 0.086      | 0.102 |
| E    | 0.40        | 0.80  | 0.015      | 0.031 |
| F    | 1.00        | 1.40  | 0.039      | 0.055 |
| F1   | 3.00 typ.   |       | 0.118 typ. |       |
| F2   | 2.00 typ.   |       | 0.079 typ. |       |
| F3   | 1.90        | 2.40  | 0.075      | 0.094 |
| F4   | 3.00        | 3.40  | 0.118      | 0.134 |
| G    | 10.90 typ.  |       | 0.429 typ. |       |
| H    | 15.45       | 16.03 | 0.608      | 0.631 |
| L    | 19.85       | 21.09 | 0.781      | 0.830 |
| L1   | 3.70        | 4.30  | 0.146      | 0.169 |
| L2   | 18.30       | 19.13 | 0.720      | 0.753 |
| L3   | 14.20       | 20.30 | 0.559      | 0.799 |
| L4   | 34.05       | 41.38 | 1.341      | 1.629 |
| L5   | 5.35        | 6.30  | 0.211      | 0.248 |
| M    | 2.00        | 3.00  | 0.079      | 0.118 |
| V    | 5° typ.     |       | 5° typ.    |       |
| V2   | 60° typ.    |       | 60° typ.   |       |
| Dia. | 3.55        | 3.65  | 0.140      | 0.144 |

### 3 Ordering information

**Table 6. Ordering information**

| Order code    | Marking       | Package | Weight | Base qty | Delivery mode |
|---------------|---------------|---------|--------|----------|---------------|
| STPS60SM200CW | STPS60SM200CW | TO-247  | 4.45 g | 30       | Tube          |

### 4 Revision history

**Table 7. Document revision history**

| Date        | Revision | Changes      |
|-------------|----------|--------------|
| 17-May-2011 | 1        | First issue. |

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