

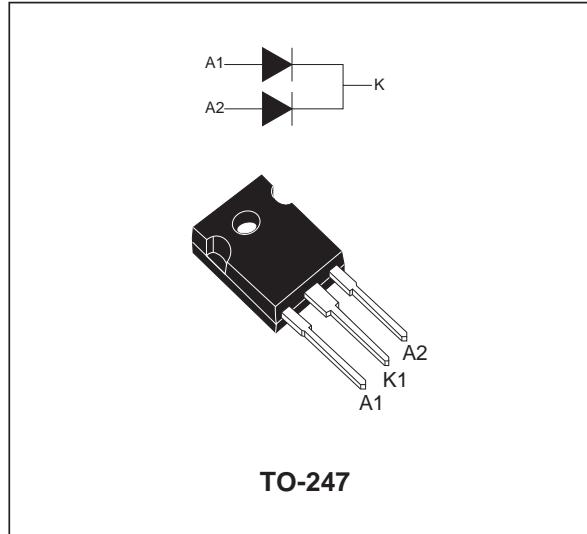
## HIGH VOLTAGE POWER SCHOTTKY RECTIFIER

### MAIN PRODUCT CHARACTERISTICS

|                            |                 |
|----------------------------|-----------------|
| <b>I<sub>F(AV)</sub></b>   | <b>2 x 20 A</b> |
| <b>V<sub>RRM</sub></b>     | <b>100 V</b>    |
| <b>T<sub>j</sub> (max)</b> | <b>175 °C</b>   |
| <b>V<sub>F</sub> (max)</b> | <b>0.61 V</b>   |

### FEATURES AND BENEFITS

- NEGLIGIBLE SWITCHING LOSSES
- LOW LEAKAGE CURRENT
- GOOD TRADE OFF BETWEEN LEAKAGE CURRENT AND FORWARD VOLTAGE DROP
- LOW THERMAL RESISTANCE
- AVALANCHE CAPABILITY SPECIFIED



### DESCRIPTION

Dual center tap Schottky rectifier suited for Switch Mode Power Supplies and high frequency DC to DC converters.

Packaged in TO-247, this device is intended for use in high frequency inverters.

### ABSOLUTE RATINGS (limiting values, per diode)

| Symbol              | Parameter                              |  |                         | Value         | Unit |
|---------------------|--|--|-------------------------|---------------|------|
| V <sub>RRM</sub>    | Repetitive peak reverse voltage        |  |                         | 100           | V    |
| I <sub>F(RMS)</sub> | RMS forward current                    |  |                         | 30            | A    |
| I <sub>F(AV)</sub>  | Average forward current                | T <sub>c</sub> = 160°C<br>δ = 0.5                        | Per diode<br>Per device | 20<br>40      | A    |
| I <sub>FSM</sub>    | Surge non repetitive forward current   | tp = 10 ms sinusoidal                                    |                         | 300           | A    |
| I <sub>RRM</sub>    | Repetitive peak reverse current        | tp = 2 μs F = 1kHz square                                |                         | 1             | A    |
| I <sub>RSM</sub>    | Non repetitive peak reverse current    | tp = 100 μs square                                       |                         | 4             | A    |
| E <sub>AS</sub>     | Non repetitive avalanche energy        | T <sub>j</sub> = 25°C L = 60 mH<br>I <sub>as</sub> = 3 A | 36                      |               | mJ   |
| P <sub>ARM</sub>    | Repetitive peak avalanche power        | tp = 1μs T <sub>j</sub> = 25°C                           | 26400                   |               | W    |
| T <sub>stg</sub>    | Storage temperature range              |  |                         | - 65 to + 175 | °C   |
| T <sub>j</sub>      | Maximum operating junction temperature |  |                         | 175           | °C   |
| dV/dt               | Critical rate of rise of rise voltage  |  |                         | 10000         | V/μs |

# STPS40H100CW

## THERMAL RESISTANCES

| Symbol        | Parameter        | Value              | Unit        |
|---------------|------------------|--------------------|-------------|
| $R_{th(j-c)}$ | Junction to case | Per diode<br>Total | 0.9<br>0.55 |
|               |                  | Coupling           | 0.1         |
| $R_{th(c)}$   |                  |                    |             |

When the diodes 1 and 2 are used simultaneously :

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

## STATIC ELECTRICAL CHARACTERISTICS

| Symbol   | Parameter               | Tests Conditions          |                      | Min. | Typ. | Max. | Unit          |
|----------|-------------------------|---------------------------|----------------------|------|------|------|---------------|
| $I_R$ *  | Reverse leakage current | $T_j = 25^\circ\text{C}$  | $V_R = V_{RRM}$      |      |      | 10   | $\mu\text{A}$ |
|          |                         | $T_j = 125^\circ\text{C}$ |                      |      | 5    | 15   | $\text{mA}$   |
| $V_F$ ** | Forward voltage drop    | $T_j = 25^\circ\text{C}$  | $I_F = 20 \text{ A}$ |      |      | 0.73 | $\text{V}$    |
|          |                         | $T_j = 125^\circ\text{C}$ | $I_F = 20 \text{ A}$ |      |      | 0.58 |               |
|          |                         | $T_j = 25^\circ\text{C}$  | $I_F = 40 \text{ A}$ |      |      | 0.85 |               |
|          |                         | $T_j = 125^\circ\text{C}$ | $I_F = 40 \text{ A}$ |      |      | 0.67 |               |

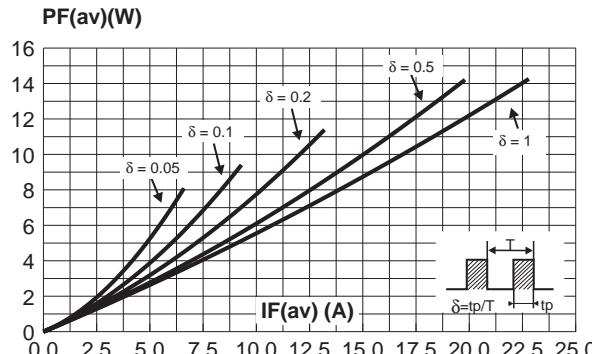
Pulse test : \*  $t_p = 5 \text{ ms}, \delta < 2\%$

\*\*  $t_p = 380 \text{ } \mu\text{s}, \delta < 2\%$

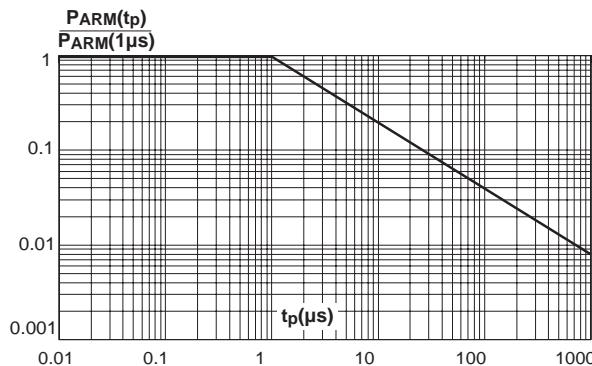
To evaluate the maximum conduction losses use the following equation :

$$P = 0.5 \times I_{F(AV)} + 0.0055 \times I_{F}^2(\text{RMS})$$

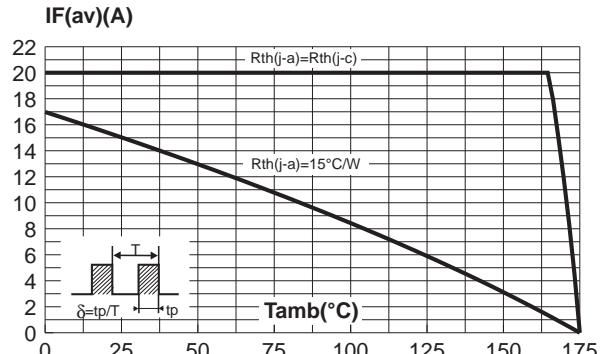
**Fig. 1:** Average forward power dissipation versus average forward current (per diode).



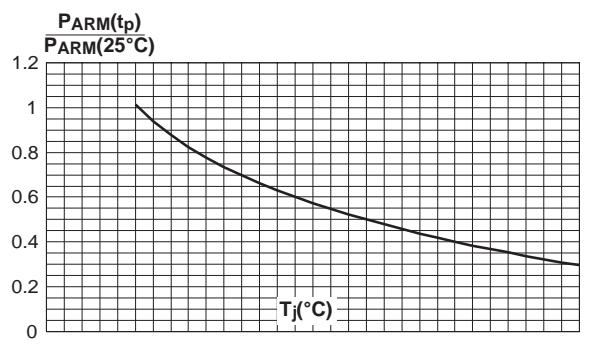
**Fig. 3:** Normalized avalanche power derating versus pulse duration.



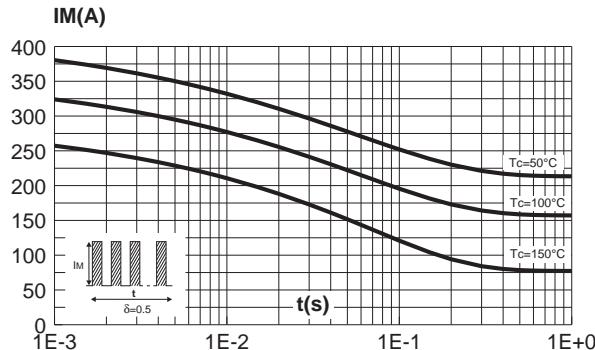
**Fig. 2:** Average forward current versus ambient temperature ( $\delta=0.5$ , per diode).



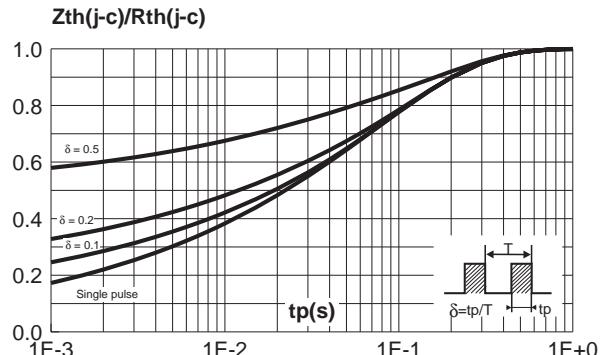
**Fig. 4:** Normalized avalanche power derating versus junction temperature.



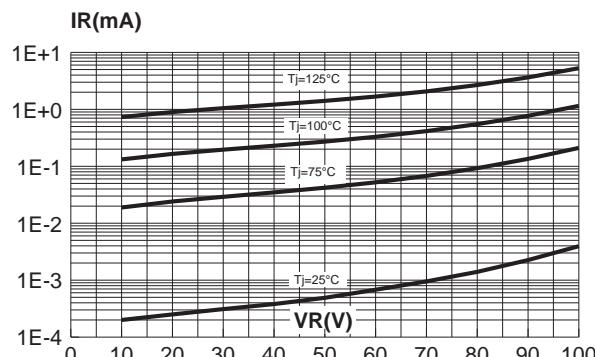
**Fig. 5:** Non repetitive surge peak forward current versus overload duration (maximum values, per diode).



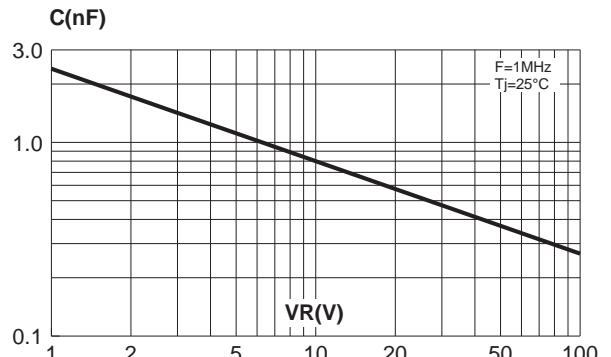
**Fig. 6:** Relative variation of thermal impedance junction to case versus pulse duration.



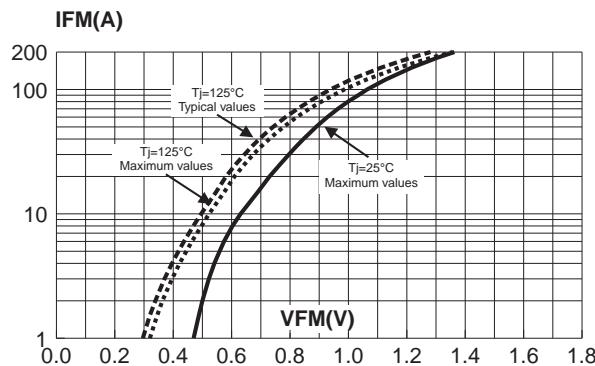
**Fig. 7:** Reverse leakage current versus reverse voltage applied (maximum values, per diode).



**Fig. 8:** Junction capacitance versus reverse voltage applied (typical values, per diode).



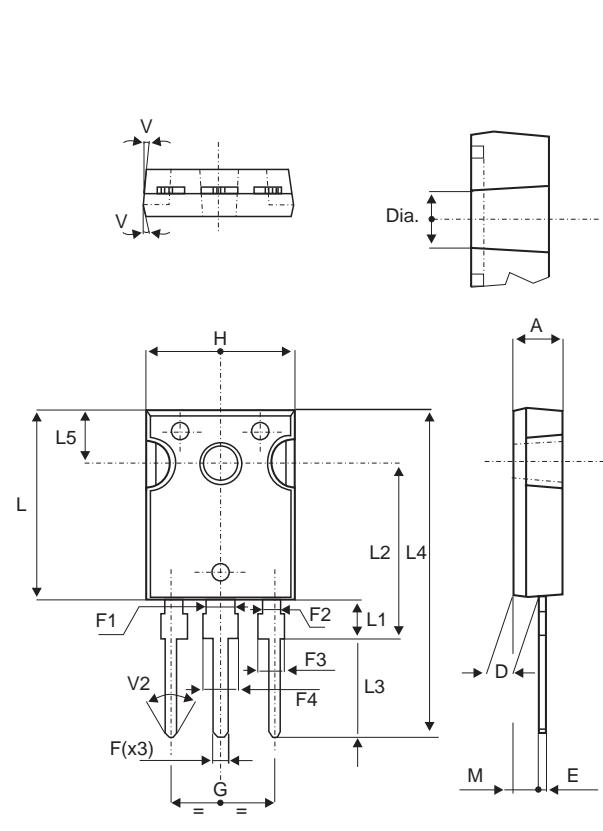
**Fig. 9:** Forward voltage drop versus forward current (per diode).



## STPS40H100CW

### PACKAGE MECHANICAL DATA

TO-247



| REF. | DIMENSIONS  |       |       |        |       |       |
|------|-------------|-------|-------|--------|-------|-------|
|      | Millimeters |       |       | Inches |       |       |
|      | Min.        | Typ.  | Max.  | Min.   | Typ.  | Max.  |
| A    | 4.85        |       | 5.15  | 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  |       |        | 0.118 |       |
| F2   |             | 2.00  |       |        | 0.078 |       |
| F3   | 2.00        |       | 2.40  | 0.078  |       | 0.094 |
| F4   | 3.00        |       | 3.40  | 0.118  |       | 0.133 |
| G    |             | 10.90 |       |        | 0.429 |       |
| H    | 15.45       |       | 15.75 | 0.608  |       | 0.620 |
| L    | 19.85       |       | 20.15 | 0.781  |       | 0.793 |
| L1   | 3.70        |       | 4.30  | 0.145  |       | 0.169 |
| L2   |             | 18.50 |       |        | 0.728 |       |
| L3   | 14.20       |       | 14.80 | 0.559  |       | 0.582 |
| L4   |             | 34.60 |       |        | 1.362 |       |
| L5   |             | 5.50  |       |        | 0.216 |       |
| M    | 2.00        |       | 3.00  | 0.078  |       | 0.118 |
| V    |             | 5°    |       |        | 5°    |       |
| V2   |             | 60°   |       |        | 60°   |       |
| Dia. | 3.55        |       | 3.65  | 0.139  |       | 0.143 |

- Cooling method: C
- Recommended torque value: 0.8 N.m.
- Maximum torque value: 1 N.m.

| Ordering type | Marking      | Package | Weight | Base qty | Delivery mode |
|---------------|--------------|---------|--------|----------|---------------|
| STPS40H100CW  | STPS40H100CW | TO-247  | 4.36g  | 30       | Tube          |

- Epoxy meets UL94,V0

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