

## HIGH VOLTAGE POWER SCHOTTKY RECTIFIER

### MAJOR PRODUCTS CHARACTERISTICS

|             |          |
|-------------|----------|
| $I_{F(AV)}$ | 2 x 40 A |
| $V_{RRM}$   | 150 V    |
| $T_j (max)$ | 175°C    |
| $V_F (max)$ | 0.74 V   |

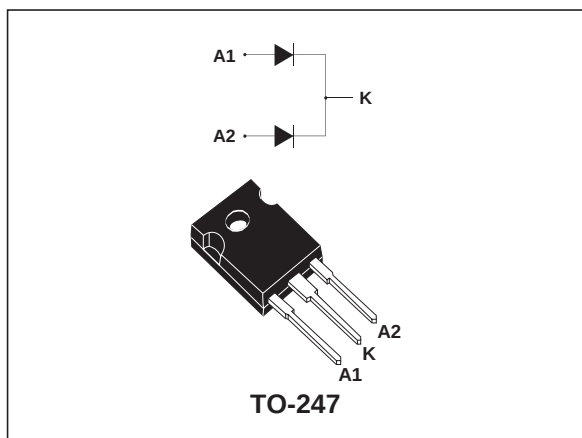
### FEATURES AND BENEFITS

- HIGH JUNCTION TEMPERATURE CAPABILITY
- LOW LEAKAGE CURRENT
- GOOD TRADE OFF BETWEEN LEAKAGE CURRENT AND FORWARD VOLTAGE DROP
- LOW THERMAL RESISTANCE
- HIGH FREQUENCY OPERATION

### DESCRIPTION

Dual center tap Schottky rectifiers suited for high frequency switch mode power supply.

Packaged in TO-247, this devices is intended for use to enhance the reliability of the application.



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

| Symbol       | Parameter                                |                                             |                          | Value         | Unit             |
|--------------|------------------------------------------|---------------------------------------------|--------------------------|---------------|------------------|
| $V_{RRM}$    | Repetitive peak reverse voltage          |                                             |                          | 150           | V                |
| $I_{F(RMS)}$ | RMS forward current                      |                                             |                          | 80            | A                |
| $I_{F(AV)}$  | Average forward current                  | $T_c = 150^\circ\text{C}$<br>$\delta = 0.5$ | Per diode<br>Per device  | 40<br>80      | A                |
| $I_{FSM}$    | Surge non repetitive forward current     | $t_p = 10 \text{ ms}$                       | Sinusoidal               | 500           | A                |
| $P_{ARM}$    | Repetitive peak avalanche power          | $t_p = 1\mu\text{s}$                        | $T_j = 25^\circ\text{C}$ | 38200         | W                |
| $T_{stg}$    | Storage temperature range                |                                             |                          | - 65 to + 175 | °C               |
| $T_j$        | Maximum operating junction temperature * |                                             |                          | 175           | °C               |
| $dV/dt$      | Critical rate of rise of reverse voltage |                                             |                          | 10000         | V/ $\mu\text{s}$ |

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

## THERMAL RESISTANCES

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

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 (per diode)

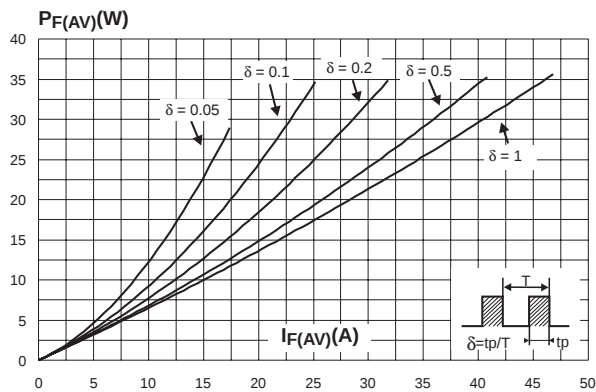
| Symbol  | Parameter               | Tests Conditions          |                     | Min. | Typ. | Max. | Unit          |
|---------|-------------------------|---------------------------|---------------------|------|------|------|---------------|
| $I_R^*$ | Reverse leakage current | $T_j = 25^\circ\text{C}$  | $V_R = V_{RRM}$     |      | 5    | 30   | $\mu\text{A}$ |
|         |                         | $T_j = 125^\circ\text{C}$ |                     |      | 6    | 20   | mA            |
| $V_F^*$ | Forward voltage drop    | $T_j = 25^\circ\text{C}$  | $I_F = 40\text{ A}$ |      | 0.8  | 0.84 | V             |
|         |                         | $T_j = 125^\circ\text{C}$ | $I_F = 40\text{ A}$ |      | 0.68 | 0.74 |               |
|         |                         | $T_j = 25^\circ\text{C}$  | $I_F = 80\text{ A}$ |      | 0.9  | 0.96 |               |
|         |                         | $T_j = 125^\circ\text{C}$ | $I_F = 80\text{ A}$ |      | 0.8  | 0.86 |               |

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

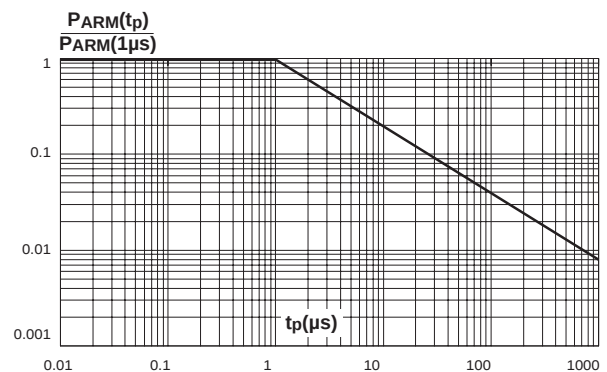
To evaluate the conduction losses use the following equation:

$$P = 0.62 \times I_{F(AV)} + 0.003 I_F^2(\text{RMS})$$

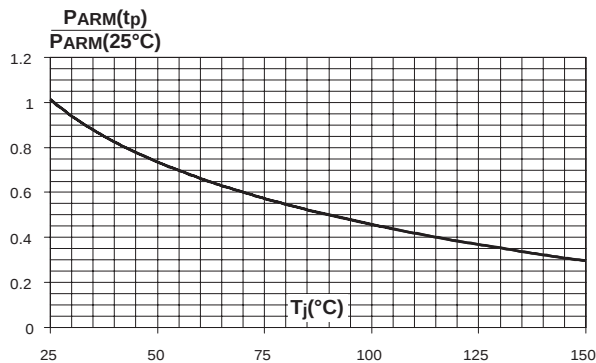
**Fig. 1:** Conduction losses versus average current (per diode).



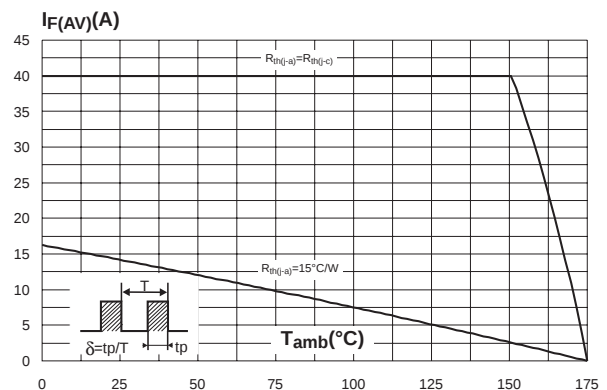
**Fig. 2:** Normalized avalanche power derating versus pulse duration.



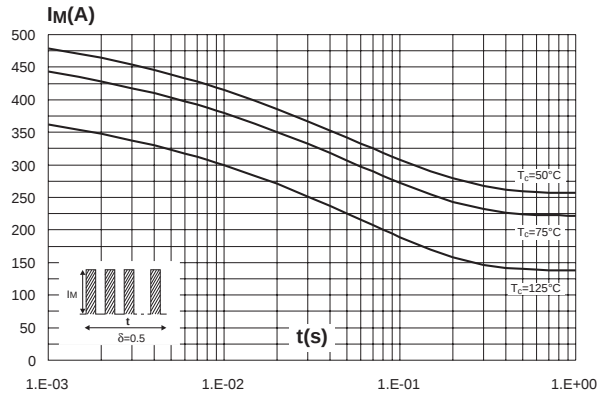
**Fig. 3:** Normalized avalanche power derating versus junction temperature.



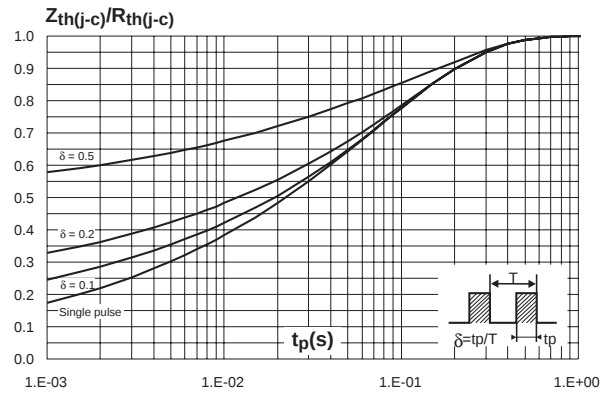
**Fig. 4:** Average forward current versus ambient temperature ( $\delta=0.5$ , per diode).



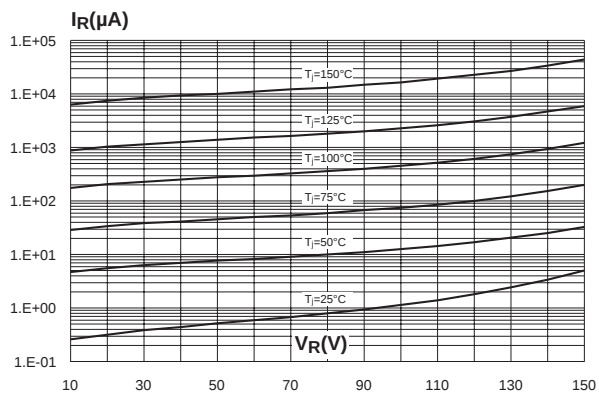
**Fig. 5:** Non repetitive surge peak forward current versus overload duration (maximum values, per diode).



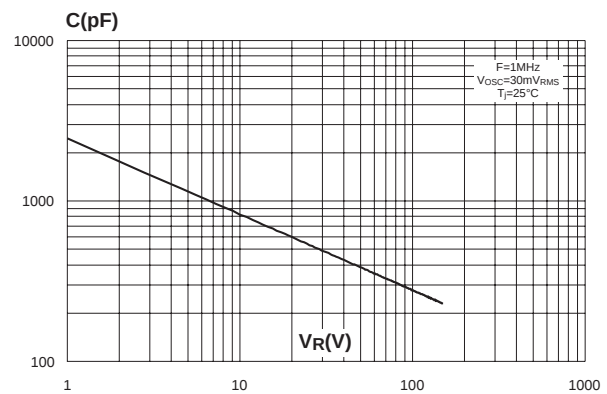
**Fig. 6:** Relative variation of thermal impedance junction to case versus pulse duration.



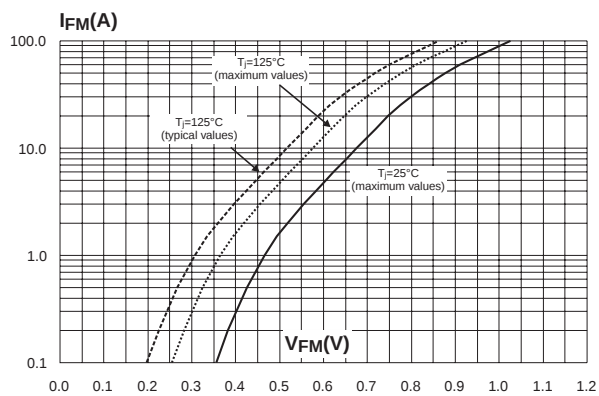
**Fig. 7:** Reverse leakage current versus reverse voltage applied (typical values, per diode).



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

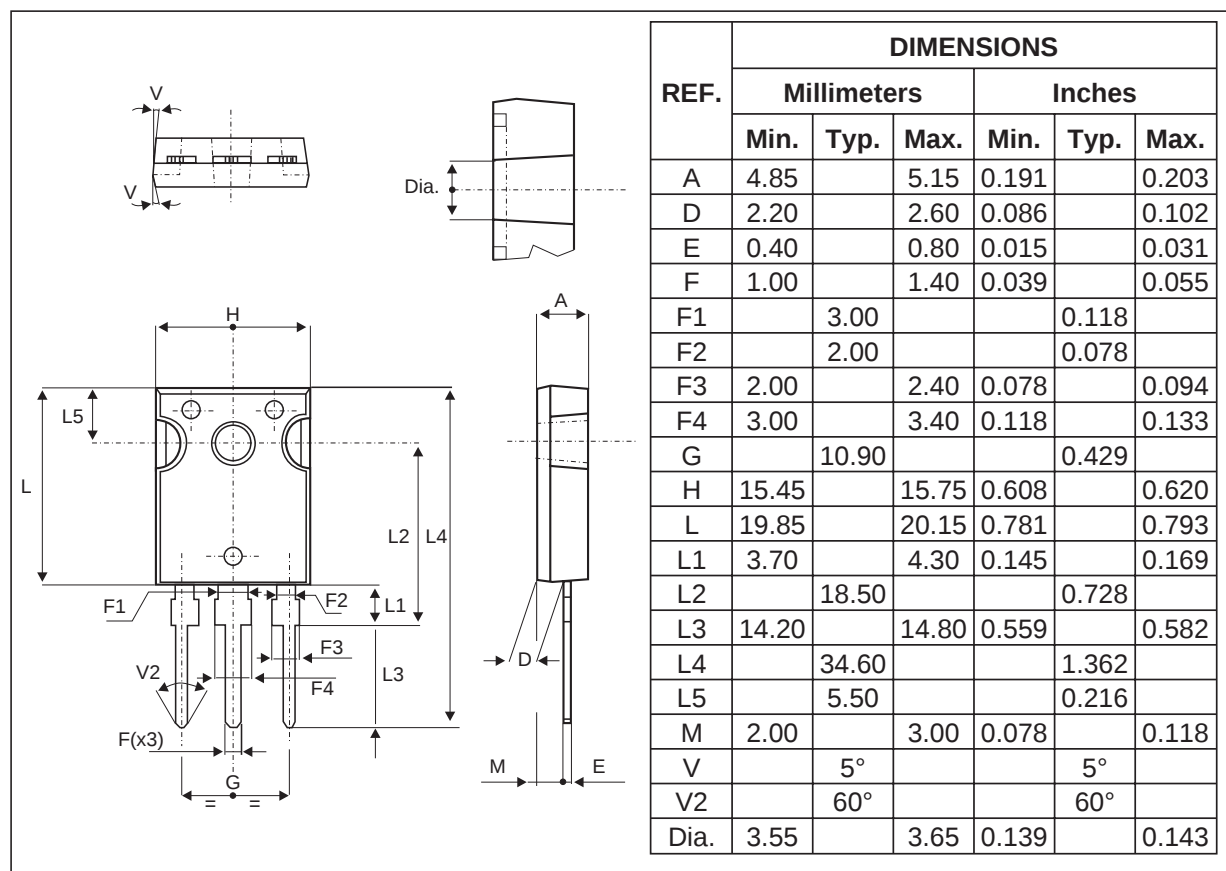


**Fig. 9:** Forward voltage drop versus forward current (per diode).



## STPS80150CW

### PACKAGE MECHANICAL DATA TO-247



- Cooling method : C
- Recommended torque value : 0.8m.N
- Maximum torque value : 1.0m.N

| Ordering type | Marking     | Package | Weight | Base qty | Delivery mode |
|---------------|-------------|---------|--------|----------|---------------|
| STPS80150CW   | STPS80150CW | TO-247  | 4.4g   | 30       | Tube          |

- Epoxy meets UL94,V0

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