

## POWER SCHOTTKY RECTIFIERS

### MAIN PRODUCTS CHARACTERISTICS

|             |            |
|-------------|------------|
| $I_{F(av)}$ | 2 x 17.5 A |
| $V_{RRM}$   | 45 V       |
| $T_j (max)$ | 175 °C     |
| $V_F (max)$ | 0.60 V     |

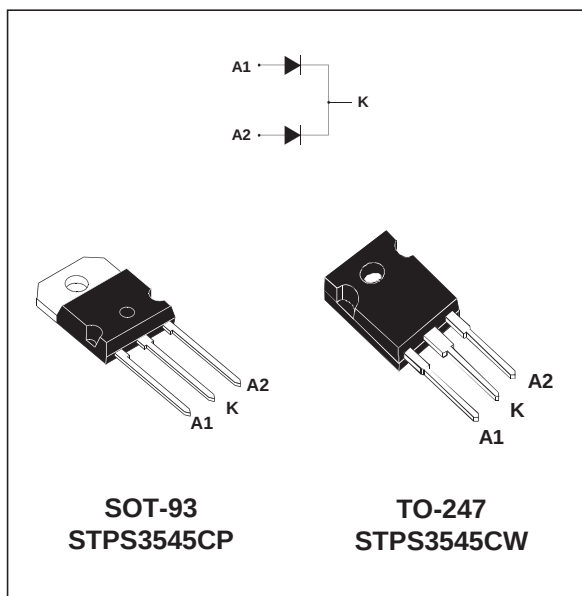
### FEATURES AND BENEFITS

- VERY SMALL CONDUCTION LOSSES
- NEGLIGIBLE SWITCHING LOSSES
- EXTREMELY FAST SWITCHING
- LOW THERMAL RESISTANCE
- AVALANCHE CAPABILITY SPECIFIED

### DESCRIPTION

Dual center tap Schottky rectifier suited for switchmode power supply and high frequency DC to DC converters.

Packaged either in SOT-93 or TO-247 this device is intended for use in low voltage, high frequency inverters, free wheeling and polarity protection applications.



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

| Symbol              | Parameter                                |                                   |                         | Value         | Unit |
|---------------------|------------------------------------------|-----------------------------------|-------------------------|---------------|------|
| V <sub>RRM</sub>    | Repetitive peak reverse voltage          |                                   |                         | 45            | V    |
| I <sub>F(RMS)</sub> | RMS forward current                      |                                   |                         | 30            | A    |
| I <sub>F(AV)</sub>  | Average forward current                  | T <sub>C</sub> = 150°C<br>δ = 0.5 | Per diode<br>Per device | 17.5<br>35    | A    |
| I <sub>FSM</sub>    | Surge non repetitive forward current     | tp = 10 ms sinusoidal             |                         | 220           | A    |
| I <sub>RRM</sub>    | Repetitive Peak reverse current          | tp = 2 μs square<br>F = 1kHz      |                         | 1             | A    |
| I <sub>RSM</sub>    | Non repetitive peak reverse current      | tp = 100 μs square                |                         | 3             | A    |
| P <sub>ARM</sub>    | Repetitive peak avalanche power          | tp = 1μs Tj = 25°C                |                         | 6000          | W    |
| T <sub>stg</sub>    | Storage temperature range                |                                   |                         | - 65 to + 175 | °C   |
| Tj                  | Maximum operating junction temperature * |                                   |                         | 175           | °C   |
| dV/dt               | Critical rate of rise of reverse voltage |                                   |                         | 10000         | V/μs |

\* :  $\frac{dP_{tot}}{dT_j} < \frac{1}{R_{th(j-a)}}$  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<br>total | 1.5<br>0.8 | °C/W |
| $R_{th(c)}$   |                  | Coupling           | 0.1        |      |

When the diodes 1 and 2 are used simultaneously :  
 $\Delta T_J(\text{diode 1}) = P(\text{diode 1}) \times R_{th(j-c)} + P(\text{diode 2}) \times R_{th(c)}$

## STATIC ELECTRICAL CHARACTERISTICS (per diode)

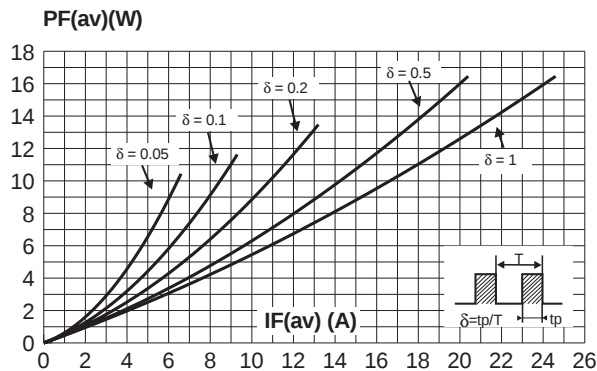
| Symbol  | Parameter               | Tests Conditions          |                       | Min. | Typ. | Max. | Unit          |
|---------|-------------------------|---------------------------|-----------------------|------|------|------|---------------|
| $I_R^*$ | Reverse leakage current | $T_J = 25^\circ\text{C}$  | $V_R = V_{RRM}$       |      |      | 200  | $\mu\text{A}$ |
|         |                         | $T_J = 125^\circ\text{C}$ |                       |      | 11   | 40   | mA            |
| $V_F^*$ | Forward voltage drop    | $T_J = 125^\circ\text{C}$ | $I_F = 17.5\text{ A}$ |      | 0.53 | 0.60 | V             |
|         |                         | $T_J = 25^\circ\text{C}$  | $I_F = 35\text{ A}$   |      |      | 0.88 |               |
|         |                         | $T_J = 125^\circ\text{C}$ | $I_F = 35\text{ A}$   |      | 0.69 | 0.76 |               |

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

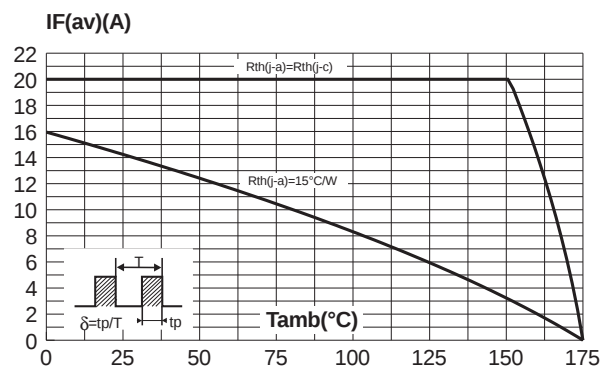
To evaluate the conduction losses use the following equation :

$$P = 0.44 \times I_{F(AV)} + 0.0091 I_{F(RMS)}^2$$

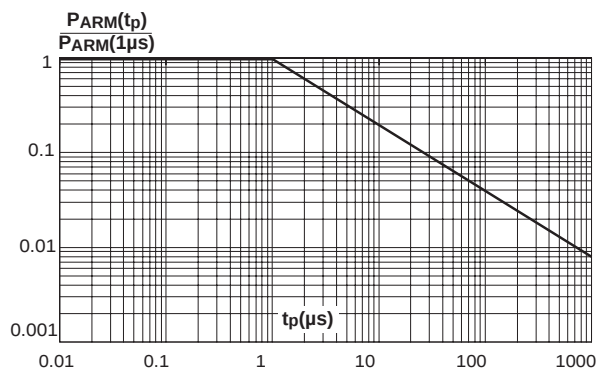
**Fig. 1:** Average forward power dissipation versus average forward current (per diode).



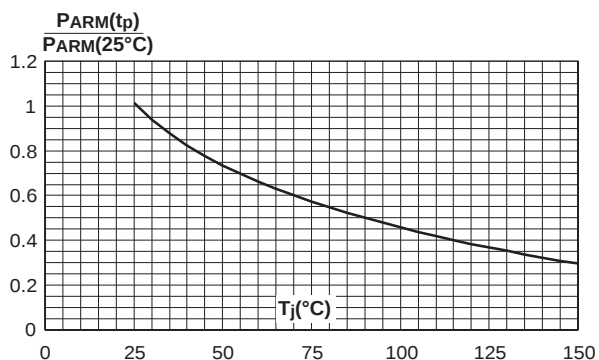
**Fig. 2:** Average current versus ambient temperature (per diode).



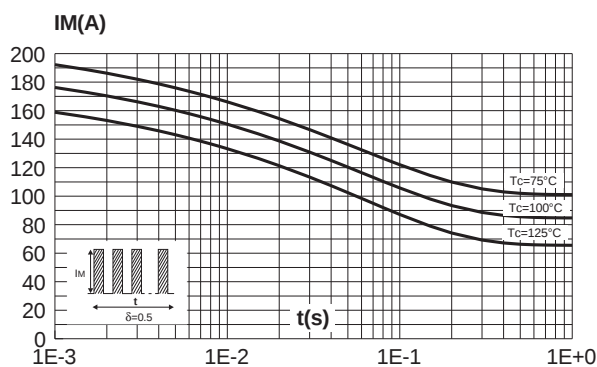
**Fig. 3:** Normalized avalanche power derating versus pulse duration.



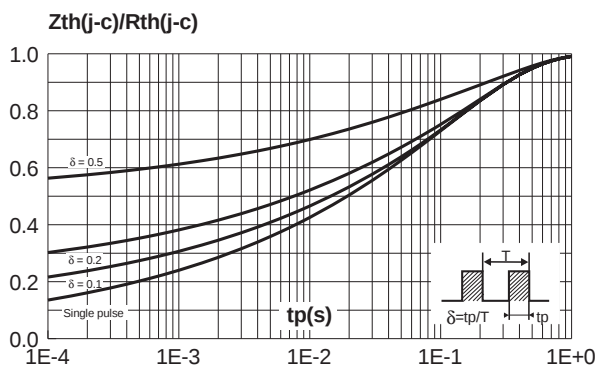
**Fig. 4:** Normalized avalanche power derating versus junction temperature.



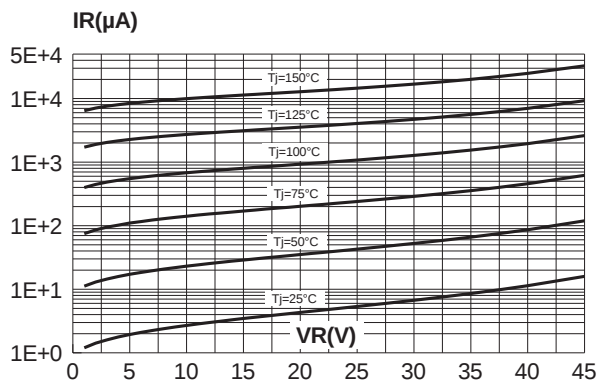
**Fig. 5:** Non repetitive surge peak forward current versus overload duration (maximum values) (per diode).



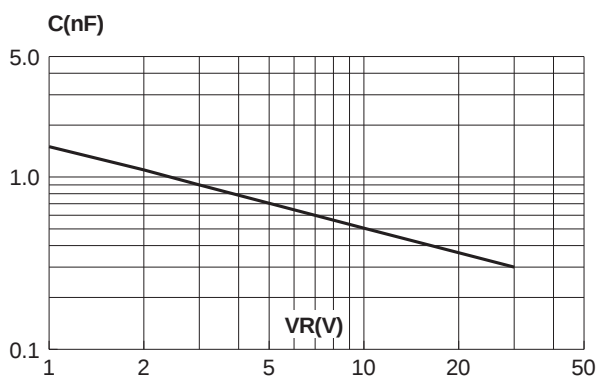
**Fig. 6:** Relative variation of thermal transient impedance junction to case versus pulse duration.



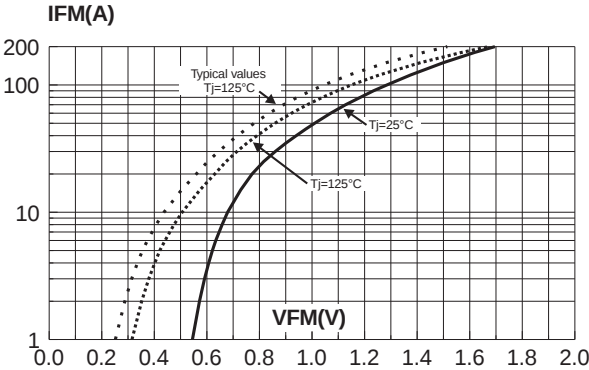
**Fig. 7:** Reverse leakage current versus reverse voltage applied (typical values) (per diode).



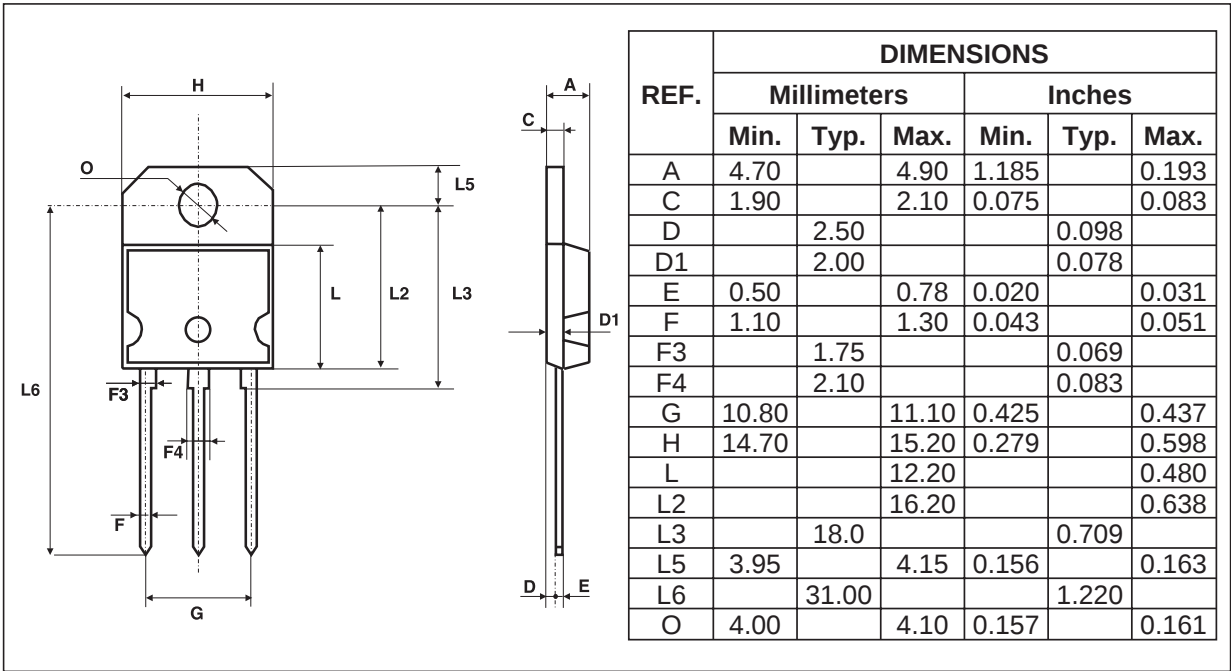
**Fig. 8:** Junction capacitance versus reverse voltage applied (typical values) (per diode).

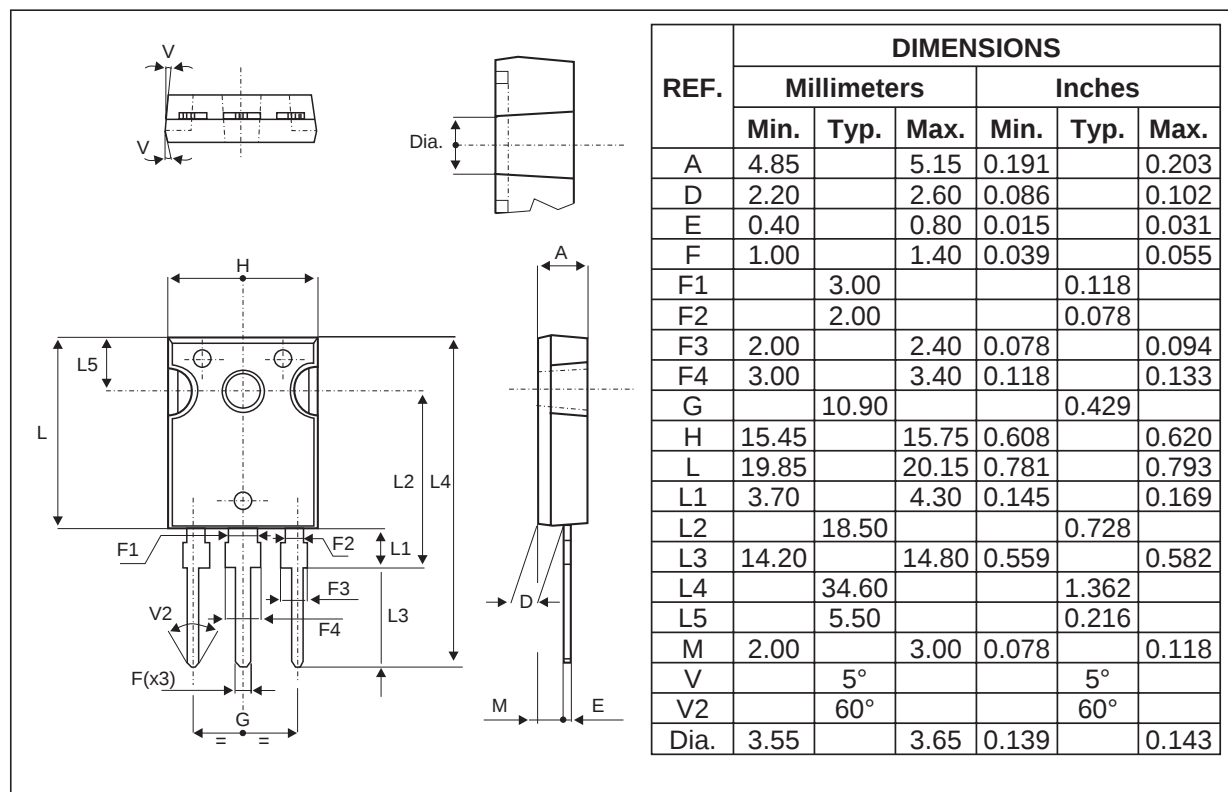


**Fig. 9:** Forward voltage drop versus forward current (maximum values) (per diode).



**PACKAGE MECHANICAL DATA**  
SOT-93



**PACKAGE MECHANICAL DATA**  
**TO-247**


| Type       | Marking    | Package | Weight  | Base qty | Delivery mode |
|------------|------------|---------|---------|----------|---------------|
| STPS3545CP | STPS3545CP | SOT-93  | 3.97 g. | 30       | Tube          |
| STPS3545CW | STPS3545CW | TO-247  | 4.46 g. | 30       | Tube          |

- Cooling method: by conduction (C)
- Recommended torque value: 0.8 N.m
- Maximum torque value: 1.0 N.m.
- Epoxy meets UL94,V0

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