



# STPS12045TV

## POWER SCHOTTKY RECTIFIER

### MAIN PRODUCT CHARACTERISTICS

|            |          |
|------------|----------|
| $I_F(AV)$  | 2 x 60 A |
| $V_{RRM}$  | 45 V     |
| $T_j(max)$ | 150 °C   |
| $V_F(max)$ | 0.67 V   |

### FEATURES AND BENEFITS

- VERY SMALL CONDUCTION LOSSES
- NEGLIGIBLE SWITCHING LOSSES
- EXTREMELY FAST SWITCHING
- LOW THERMAL RESISTANCE
- INSULATED PACKAGE:  
Insulating voltage = 2500 V<sub>(RMS)</sub>  
Capacitance = 45 pF

### DESCRIPTION

Dual power Schottky rectifier suited for Switched Mode Power Supplies and high frequency DC to DC converters.

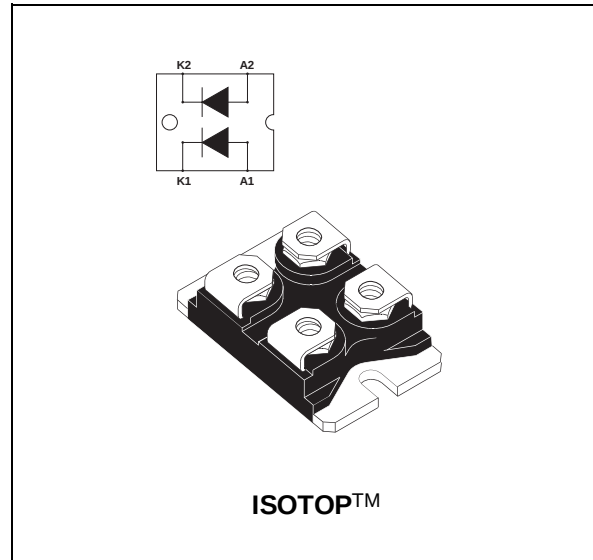
Packaged in ISOTOP, this device is especially intended for use in low voltage, high frequency inverters, free wheeling and polarity protection applications.

### 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                      |                                  |                         | 125           | A    |
| I <sub>F(AV)</sub>  | Average forward current                  | T <sub>c</sub> = 95°C<br>δ = 0.5 | Per diode<br>Per device | 60<br>120     | A    |
| I <sub>FSM</sub>    | Surge non repetitive forward current     | tp = 10 ms Sinusoidal            |                         | 900           | A    |
| I <sub>RRM</sub>    | Repetitive peak reverse current          | tp = 2 μs square F = 1kHz        |                         | 2             | A    |
| I <sub>RSM</sub>    | Non repetitive peak reverse current      | tp = 100μs square                |                         | 5             | A    |
| T <sub>stg</sub>    | Storage temperature range                |                                  |                         | - 55 to + 150 | °C   |
| T <sub>j</sub>      | Maximum operating junction temperature * |                                  |                         | 150           | °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

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**THERMAL RESISTANCES**

| Symbol        | Parameter        |           | Value | Unit                 |
|---------------|------------------|-----------|-------|----------------------|
| $R_{th(j-c)}$ | Junction to case | Per diode | 1     | $^{\circ}\text{C/W}$ |
|               |                  | Total     | 0.55  |                      |
| $R_{th(c)}$   |                  | Coupling  | 0.1   |                      |

When the diodes 1 and 2 are used simultaneously :

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

**STATIC ELECTRICAL CHARACTERISTICS (per diode)**

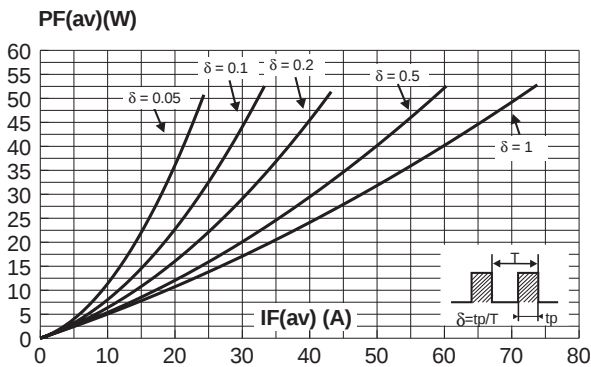
| Symbol  | Parameter               | Tests Conditions            |                      | Min. | Typ. | Max. | Unit |
|---------|-------------------------|-----------------------------|----------------------|------|------|------|------|
| $I_R^*$ | Reverse leakage current | $T_j = 25^{\circ}\text{C}$  | $V_R = V_{RRM}$      |      |      | 1    | mA   |
|         |                         | $T_j = 125^{\circ}\text{C}$ |                      |      | 43   | 150  |      |
| $V_F^*$ | Forward voltage drop    | $T_j = 25^{\circ}\text{C}$  | $I_F = 120\text{ A}$ |      |      | 0.91 | V    |
|         |                         | $T_j = 125^{\circ}\text{C}$ | $I_F = 120\text{ A}$ |      | 0.72 | 0.87 |      |
|         |                         | $T_j = 125^{\circ}\text{C}$ | $I_F = 60\text{ A}$  |      | 0.52 | 0.67 |      |

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

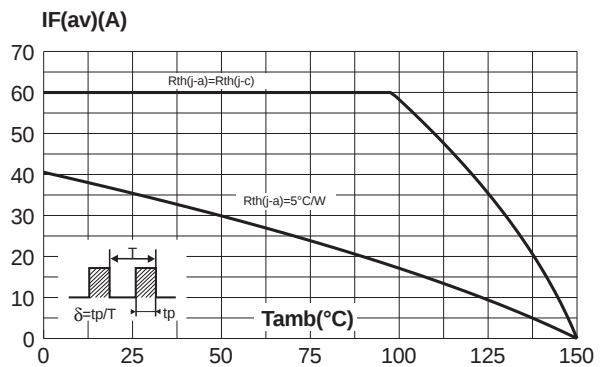
To evaluate the conduction losses use the following equation :

$$P = 0.47 \times I_{F(AV)} + 0.00333 \times I_{F(RMS)}^2$$

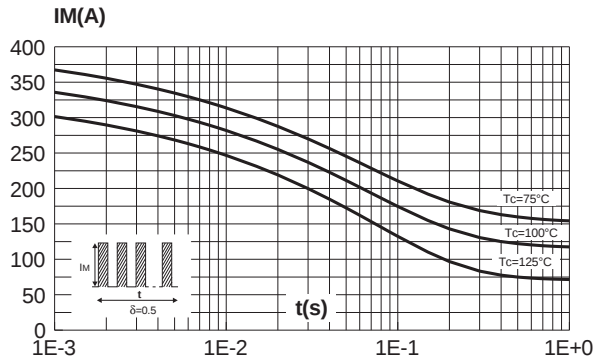
**Fig. 1:** Average forward power dissipation versus average forward current (per diode).



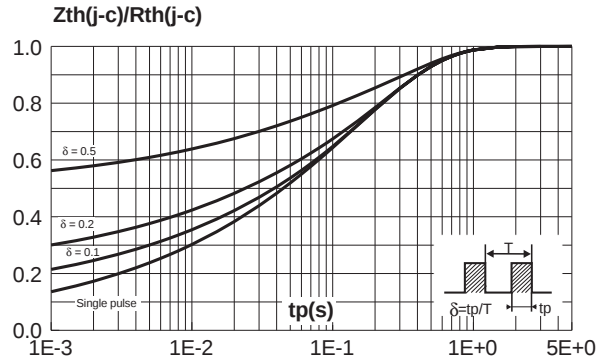
**Fig. 2:** Average current versus case temperature ( $\delta = 0.5$ ) (per diode).



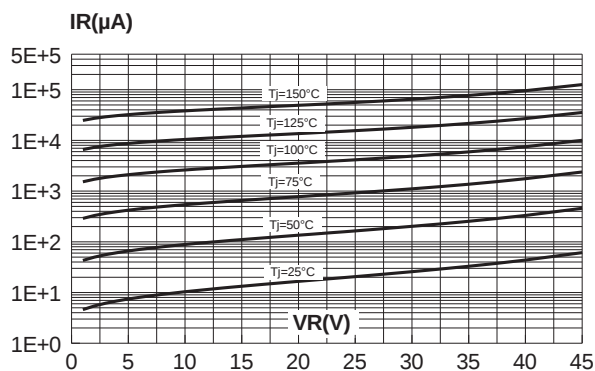
**Fig. 3:** Non repetitive surge peak forward current versus overload duration (maximum values, per diode).



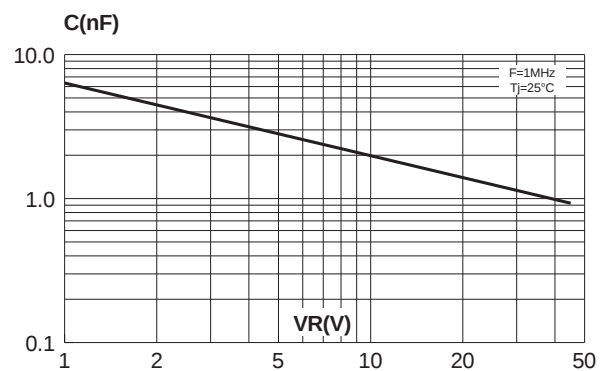
**Fig.4 :** Relative variation of thermal transient impedance junction to case versus pulse duration.



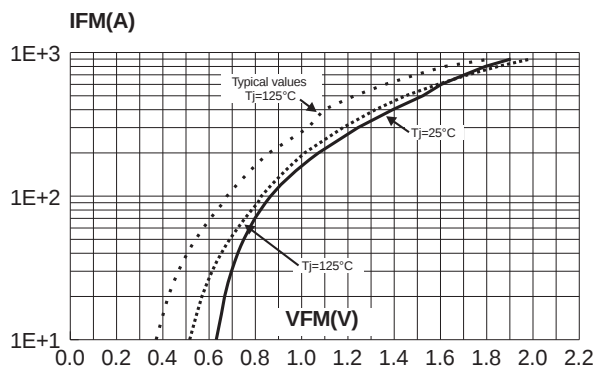
**Fig. 5:** Reverse leakage current versus reverse voltage applied (typical values, per diode).



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



**Fig. 7:** Forward voltage drop versus forward current (maximum values, per diode).



**PACKAGE MECHANICAL DATA**  
 ISOTOP

| REF. | DIMENSIONS  |       |            |       |
|------|-------------|-------|------------|-------|
|      | Millimeters |       | Inches     |       |
|      | Min.        | Max.  | Min.       | Max.  |
| A    | 11.80       | 12.20 | 0.465      | 0.480 |
| A1   | 8.90        | 9.10  | 0.350      | 0.358 |
| B    | 7.8         | 8.20  | 0.307      | 0.323 |
| C    | 0.75        | 0.85  | 0.030      | 0.033 |
| C2   | 1.95        | 2.05  | 0.077      | 0.081 |
| D    | 37.80       | 38.20 | 1.488      | 1.504 |
| D1   | 31.50       | 31.70 | 1.240      | 1.248 |
| E    | 25.15       | 25.50 | 0.990      | 1.004 |
| E1   | 23.85       | 24.15 | 0.939      | 0.951 |
| E2   | 24.80 typ.  |       | 0.976 typ. |       |
| G    | 14.90       | 15.10 | 0.587      | 0.594 |
| G1   | 12.60       | 12.80 | 0.496      | 0.504 |
| G2   | 3.50        | 4.30  | 0.138      | 0.169 |
| F    | 4.10        | 4.30  | 0.161      | 0.169 |
| F1   | 4.60        | 5.00  | 0.181      | 0.197 |
| P    | 4.00        | 4.30  | 0.157      | 0.69  |
| P1   | 4.00        | 4.40  | 0.157      | 0.173 |
| S    | 30.10       | 30.30 | 1.185      | 1.193 |

| Type        | Marking     | Package | Weight                 | Base qty | Delivery mode |
|-------------|-------------|---------|------------------------|----------|---------------|
| STPS12045TV | STPS12045TV | ISOTOP  | 28.9<br>without screws | 10       | Tube          |

- Cooling method: by conduction (C)
- Recommended torque value: 1.3 N.m.
- Maximum torque value: 1.5 N.m.
- Epoxy meets UL94,V0

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