

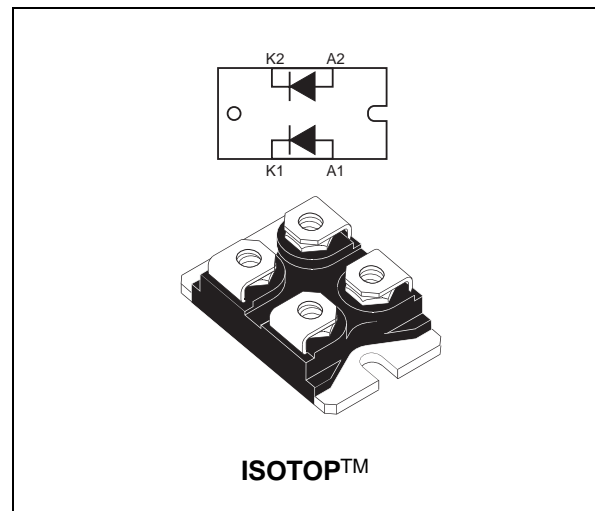
## HIGH VOLTAGE POWER SCHOTTKY RECTIFIER

### MAIN PRODUCT CHARACTERISTICS

|             |                 |
|-------------|-----------------|
| $I_{F(AV)}$ | <b>2 x 80 A</b> |
| $V_{RRM}$   | <b>100 V</b>    |
| $T_j$ (max) | <b>150 °C</b>   |
| $V_F$ (max) | <b>0.68 V</b>   |

### FEATURES AND BENEFITS

- NEGLIGIBLE SWITCHING LOSSES
- HIGH JUNCTION TEMPERATURE CAPABILITY
- LOW LEAKAGE CURRENT
- GOOD TRADE OFF BETWEEN LEAKAGE CURRENT AND FORWARD VOLTAGE DROP
- AVALANCHE RATED
- LOW INDUCTION PACKAGE
- INSULATED PACKAGE:  
Insulating Voltage = 2500 V<sub>(RMS)</sub>  
Capacitance = 45 pF



### DESCRIPTION

High voltage dual Schottky rectifier designed for high frequency telecom and computer Switched Mode Power Supplies and other power converters.

Packaged in ISOTOP, this device is intended for use in medium voltage operation, and particularly, in high frequency circuitries where low switching losses and low noise are required.

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

| Symbol       | Parameter                                |  | Value                   | Unit             |   |
|--------------|--|--|-------------------------|------------------|---|
| $V_{RRM}$    | Repetitive peak reverse voltage          |  | 100                     | V                |   |
| $I_{F(RMS)}$ | RMS forward current                      |  | 180                     | A                |   |
| $I_{F(AV)}$  | Average forward current                  | $T_c = 110^\circ\text{C}$<br>$\delta = 0.5$    | Per diode<br>Per device | 80<br>160        | A |
| $I_{FSM}$    | Surge non repetitive forward current     | $t_p = 10 \text{ ms}$ sinusoidal               | 1000                    | A                |   |
| $I_{RRM}$    | Repetitive peak reverse current          | $t_p = 2 \mu\text{s}$ square $F = 1\text{kHz}$ | 2                       | A                |   |
| $I_{RSM}$    | Non repetitive peak reverse current      | $t_p = 100 \mu\text{s}$ square                 | 10                      | A                |   |
| $T_{stg}$    | Storage temperature range                |  | -55 to +150             | °C               |   |
| $T_j$        | Maximum operating junction temperature * |  | 150                     | °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

# STPS160H100TV

## THERMAL RESISTANCES

| Symbol               | Parameter        | Value   | Unit     |
|----------------------|------------------|---------|----------|
| R <sub>th(j-c)</sub> | Junction to case | Per leg | 0.9 °C/W |
|                      |                  | Total   | 0.5 °C/W |
| R <sub>th(c)</sub>   | Coupling         | 0.14    | °C/W     |

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

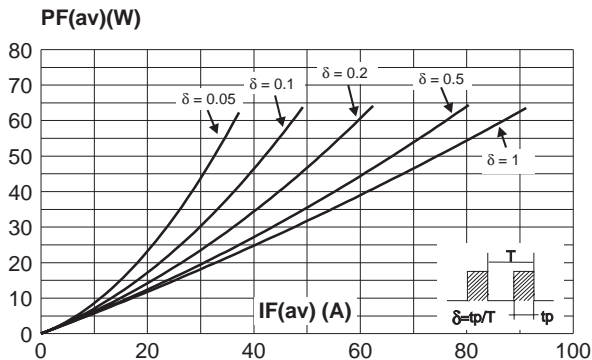
## STATIC ELECTRICAL CHARACTERISTICS (per diode)

| Symbol            | Parameter               | Tests Conditions       | Min.                              | Typ. | Max. | Unit  |   |
|-------------------|-------------------------|------------------------|-----------------------------------|------|------|-------|---|
| I <sub>R</sub> *  | Reverse leakage Current | T <sub>j</sub> = 25°C  | V <sub>R</sub> = V <sub>RRM</sub> |      |      | 40 μA |   |
|                   |                         | T <sub>j</sub> = 125°C |                                   |      | 13   | 50 mA |   |
| V <sub>F</sub> ** | Forward Voltage drop    | T <sub>j</sub> = 25°C  | I <sub>F</sub> = 60 A             |      |      | 0.75  | V |
|                   |                         | T <sub>j</sub> = 125°C | I <sub>F</sub> = 60 A             |      | 0.59 | 0.63  |   |
|                   |                         | T <sub>j</sub> = 25°C  | I <sub>F</sub> = 80 A             |      |      | 0.80  |   |
|                   |                         | T <sub>j</sub> = 125°C | I <sub>F</sub> = 80 A             |      | 0.63 | 0.68  |   |
|                   |                         | T <sub>j</sub> = 25°C  | I <sub>F</sub> = 120 A            |      |      | 0.87  |   |
|                   |                         | T <sub>j</sub> = 125°C | I <sub>F</sub> = 120 A            |      | 0.69 | 0.74  |   |
|                   |                         | T <sub>j</sub> = 25°C  | I <sub>F</sub> = 160 A            |      |      | 0.92  |   |
|                   |                         | T <sub>j</sub> = 125°C | I <sub>F</sub> = 160 A            |      | 0.75 | 0.80  |   |

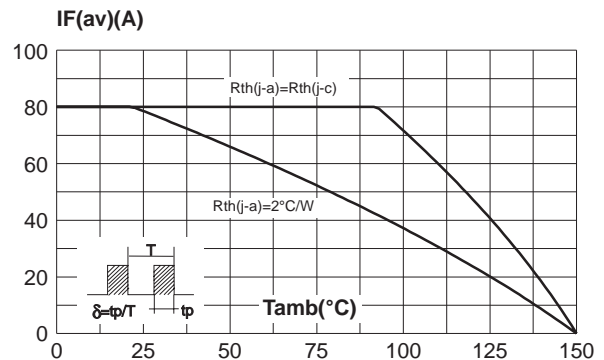
Pulse test : \* t<sub>p</sub> = 5 ms, δ < 2%  
 \*\* t<sub>p</sub> = 380 μs, δ < 2%

To evaluate the conduction losses use the following equation :  
 $P = 0.56 \times I_{F(AV)} + 0.0015 \times I_{F(RMS)}^2$

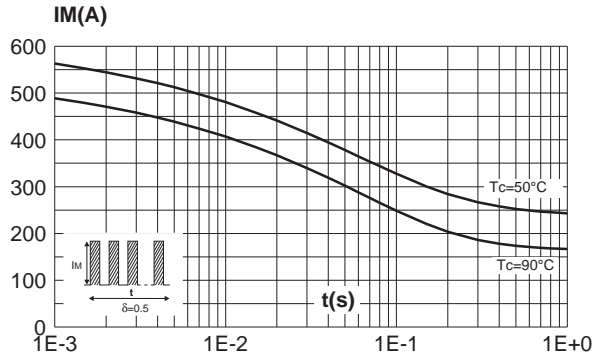
**Fig. 1:** Average forward power dissipation versus average forward current (per diode).



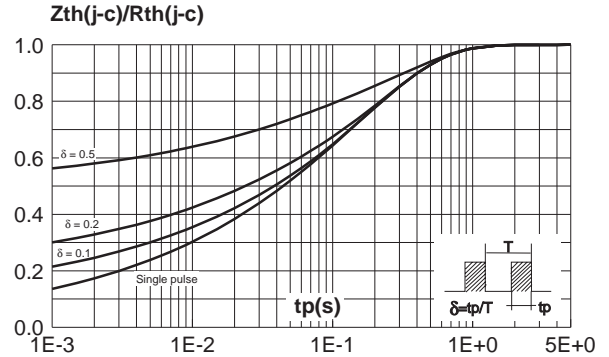
**Fig. 2:** Average forward current versus ambient temperature (δ=0.5, per diode).



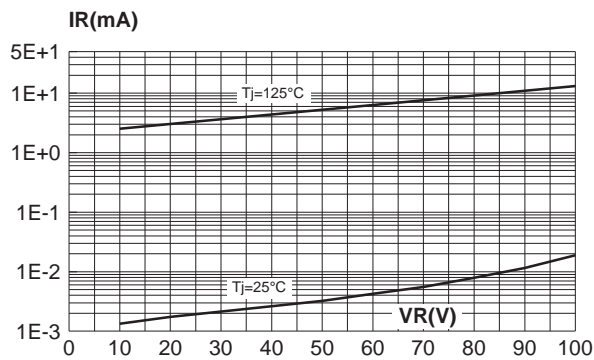
**Fig. 3:** Non repetitive surge peak forward current versus overload duration (maximum values, per diode).



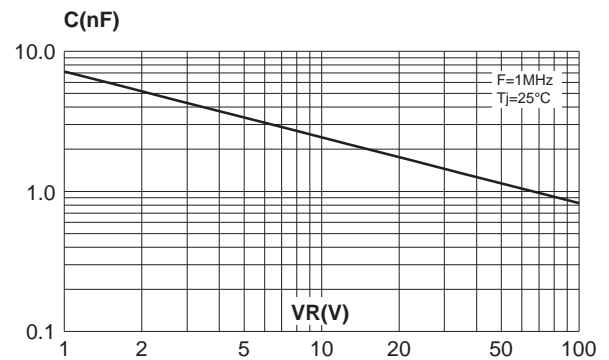
**Fig. 4:** Relative variation of thermal impedance junction to case versus pulse duration (per diode).



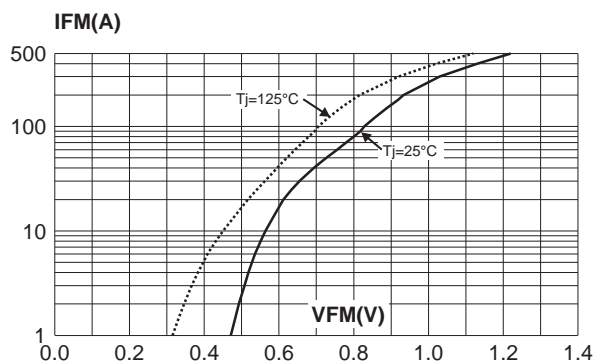
**Fig. 5:** Reverse leakage current versus reverse voltage applied (typical values, per diode).



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



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



# STPS160H100TV

## 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 |

- Cooling method: C
- Recommended torque value: 1.3 N.m.
- Maximum torque value: 1.5 N.m.

| Ordering type | Marking       | Package | Weight                | Base qty | Delivery mode |
|---------------|---------------|---------|-----------------------|----------|---------------|
| STPS160H100TV | STPS160H100TV | ISOTOP  | 27g<br>without screws | 10       | Tube          |

- Epoxy meets UL94,V0

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